

**BUSINESS-TO-BUSINESS ELECTRONIC MARKETPLACES:  
MEMBERSHIP AND USE DRIVERS**

A Dissertation

by

HOPE ARLENE KOCH

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2003

Major Subject: Information and Operations Management

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December 2003

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## **ABSTRACT**

Business-to-Business Electronic Marketplaces: Membership and Use Drivers.

(December 2003)

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Business-to-business (B2B) electronic marketplaces (e-marketplaces) are one of the most heralded developments in recent years. These marketplaces bring together businesses buying and selling goods and services in an online buying community. E-marketplaces promise to increase the efficiency and effectiveness of procurement activities by replacing traditional manual processes with automated electronic procedures and by expanding the number of available trading partners. Despite the technology availability and the high potential benefits, very few e-marketplaces have succeeded. This three-year study identifies and investigates two major B2B e-marketplace stumbling blocks: attracting a sufficient number of members, and then influencing these members to use the e-marketplace.

This investigation uses a variety of qualitative techniques to solicit information from nearly fifty executives representing four B2B e-marketplaces with contrasting membership and use levels. Within each e-marketplace, the study solicited information from high and low use organizations, buying and selling organizations, and a nonparticipant organization. The interview data was analyzed using line-by-line analysis from grounded theory. The analysis involved assimilating the unique stories of each manager into drivers that affect e-marketplace membership or use. These drivers were then compared to membership levels and/or use levels.

The analysis resulted in three research models. Each research model is a data-driven representation of factors driving B2B e-marketplace membership, B2B e-marketplace use, and a particular organization's B2B e-marketplace use. Each model

contains several unique drivers and offers a comprehensive picture of what is happening in e-marketplaces.

These findings enhance management's understanding of e-marketplaces, their role in business, their challenges, and ways of overcoming these challenges in order to reap the benefits of e-marketplace participation. This study brings one of the first grounded theory investigations of B2B e-marketplace membership and use to the limited academic research in this area. This research offers insights to a number of theories, including transaction cost economics, institutional theory, resource dependency theory, and public goods theory.

## **DEDICATION**

For my husband, Kevin

## ACKNOWLEDGEMENTS

Having the opportunity to work on a Ph.D. and do a dissertation like this was a life-long dream. So many people made this dream possible. I thank and appreciate each one of you.

I appreciate the professors at Texas A&M University and each one's help with this project. Dr. E. Powell Robinson helped develop the research, establish corporate relationships, and fund the research. The funding Dr. Robinson obtained from Texas A&M University's Industrial Distribution's Information Systems Consortium made it possible for me to travel throughout the United States collecting research data. Dr. Robinson also gave me the opportunity to learn by including me in several of his invited speaking engagements. Dr. Joobin Choobineh helped develop this research and worked to improve the research, presentation, and writing. Dr. Choobineh's work on the proposal and his recommendation letter were key to my research being accepted to the International Conference on Information Systems doctoral consortium. An event I will always remember.

Dr. Kathryn Henderson taught me qualitative research. This research began in her qualitative methods course. Dr. Henderson designs her class so students "enter the field" and do qualitative research. Dr. Henderson's experience, advice, and guidance were invaluable. Dr. Marshall Scott Poole's mastery of the existing literature and comments were critical to my understanding of this project's contribution to the greater body of academic literature. I also appreciate Dr. Bill Richmond's participation on the committee and help with the project.

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Doing this research involved interviewing executives from nearly fifty large United States corporations. I appreciate the companies and the executives for their

participation. Mark Abbe and my husband, Kevin, introduced me to the executives that participated in this study. I am thankful for Mark's help and his friendship.

I appreciate my mom for being proud of whatever I do and for teaching me to be positive, treat people nicely, and do my best. My husband's enthusiasm, encouragement, and assurance throughout our life together mean the world to me.



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## CHAPTER I

### INTRODUCTION

Business-to-business (B2B) electronic marketplaces (e-marketplaces) have been one of the most heralded developments in recent years. These marketplaces bring businesses selling goods and services with businesses buying goods and services into an online community. E-marketplaces promise to increase the efficiency and effectiveness of business purchasing by replacing traditional limited seller-buyer networks with a marketplace with many more sellers competing on the basis of cost, quality, and service. E-marketplaces allow sellers to reach more buyers, so everyone benefits. Given the trillions of dollars spent in business transactions annually, the e-marketplace concept is attractive. When industry discovered e-marketplaces in late 1999, analysts and technology experts predicted e-marketplaces would transform existing industry practices almost over night. Press releases of organization joining e-marketplaces, predictions of exponential growth, and anticipated benefits filled the business press literature. The quotes below illustrate this.

In 2001 between 600 and 1,000 B2B e-marketplaces exist; by 2003 there will be 4,200 (Tumolo 2001).

B2B e-marketplaces will result in increased cost savings, increased operational efficiency, and improved information, with some predicting up to 30% annual cost savings (Tumolo 2001) reaching \$1 trillion by 2010 (Memishi 2001).

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This dissertation follows the style and format of *Information Systems Research*.

However, as witnessed by the dot.com crash, establishing a financially viable B2B e-marketplace takes longer and is more difficult than anticipated. Hundreds of e-marketplaces have gone out of business, many without handling a single transaction (Hamm 2002). As such, many organizations abandoned their e-marketplace endeavors. The following statistics show the decline of e-marketplaces.

In one survey, 50% of companies said B2B e-marketplaces were either absolutely not or mostly not meeting their expectations (Clark 2001).

Analysts predict ten failures for every successful B2B e-marketplace (Bannan 2001).

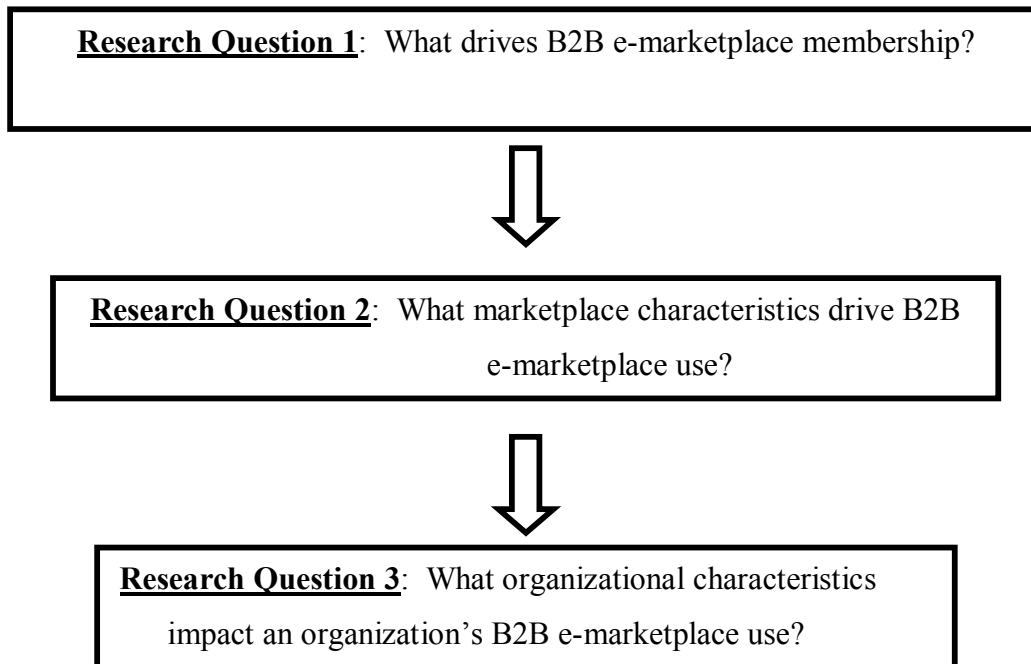
At a 2001 Forrester conference, Siebel Systems' founder and Chief Executive Officer predicted, no B2B e-marketplace will survive (Gulledge 2002).

The consulting firm Booz Allen & Hamilton, Inc. estimated there were 1734 online marketplaces in 2000 and only 407 are expected to remain by 2004 (Meehan 2002).

During the electronic commerce (EC) boom and through the EC bust, we were conducting field research on two firms' B2B e-marketplace endeavors. Each firm was a founding member of an industry B2B e-marketplace. Both e-marketplaces struggled to attract members and both firms struggled to use the offerings of the e-marketplace they had joined. The eighteen-month field studies indicated two major challenges to establishing a viable B2B e-marketplace: attracting members, and then influencing the members to use the marketplace. Given this situation, this dissertation investigates three related questions. See Figure 1.

Question one investigates marketplace membership drivers. Question two investigates marketplace characteristics making use feasible for all the e-marketplace's member organizations. For example, is the e-marketplace as efficient as existing industry procurement procedures? Question three focuses on characteristics within each member organization impacting the organization's use of the e-marketplace. For example, does the organization's top management support marketplace use?

**Figure 1 Research Questions**

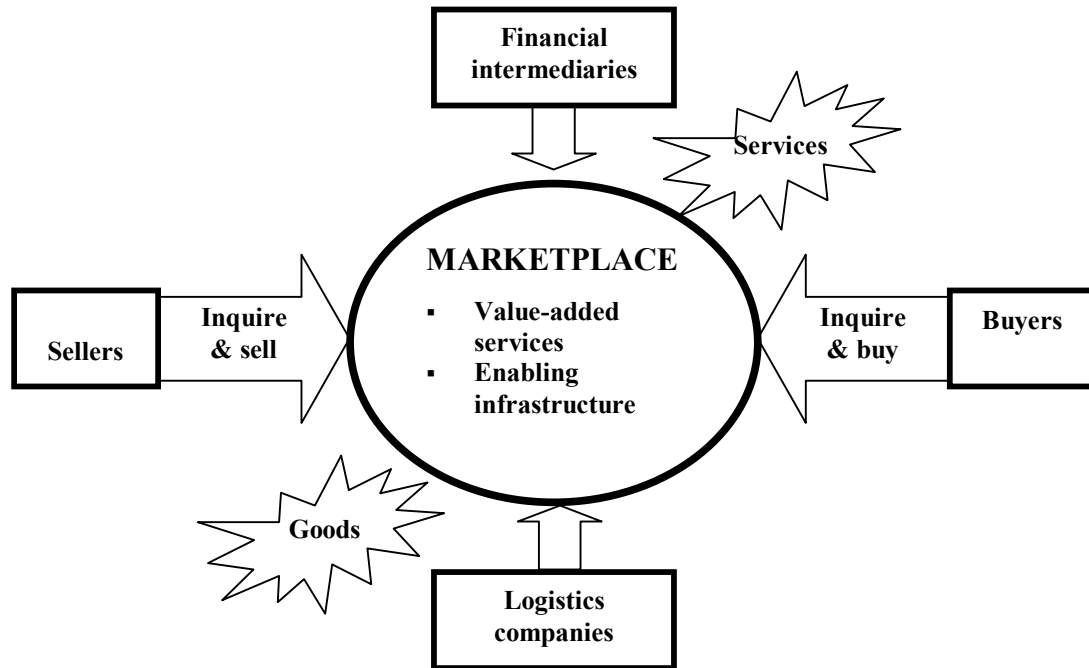


### **1. 1. WHAT IS A B2B E-MARKETPLACE?**

A B2B e-marketplace is a network facilitated by telecommunications created to enable multiple buyers and sellers to exchange information and complete transactions (Zwass 1999) for goods and services in a virtual location. B2B e-marketplaces can include financial intermediaries to settle transactions and logistics companies to assist in transporting products. See Figure 2. The ultimate goal for B2B e-marketplaces is to evolve into a one-stop shop addressing all its members' commerce, content, and collaboration needs (Brunn et al. 2002).



**Figure 2 B2B E-marketplace**



Associated with a B2B e-marketplace is a business model and a set of value propositions offered to its stakeholders. The business model describes how the marketplace is going to make money. The value propositions describe benefits the marketplace offers its members and other stakeholders.

Business models include (Robinson 2003) products and services offered, activities the firm performs to deliver these products and services, technology requirements, strategic partners, and revenue sources. Revenue sources can include fees for joining, fees based on transactions, fees based on sales, advertising charges, software charges, consulting charges, or any combination of these.

B2B e-marketplaces build value propositions on three elements: increased market efficiencies, increased supply chain efficiencies, and new value creation (Brunn et al. 2002). Increased market efficiencies occur as B2B e-marketplaces use the Internet's speed and transparency to intensify competition, bringing prices closer to

theoretical equilibrium. Increased supply chain efficiencies occur as B2B e-marketplaces provide increased visibility across the supply chain, facilitating improved demand forecasting, inventory management, and production planning. New value creation will occur as B2B e-marketplaces promote collaboration and allow increased information availability.

Within these basic value propositions, B2B e-marketplaces offer an array of value-added services. These services may include establishing a platform for data aggregation, spot purchases, auctions, catalog hosting, price negotiation, demand forecasting, collaboration, and inventory management.

A B2B e-marketplace is a type of interorganizational information system (IOIS). An IOIS is an infrastructure of computers and communication crossing company boundaries and permitting information sharing (Cash and Konsynski 1985). Unlike organization-specific information systems, successful IOIS use requires cooperation and communication between at least two firms. Electronic data interchange (EDI), customer-oriented strategic systems, and electronic commerce are the most common IOIS forms. B2B e-marketplaces differ from other IOIS, as B2B e-marketplaces require that a critical mass of buyers and sellers use the marketplace.

## **1.2. RESEARCH METHOD AND CONTRIBUTIONS**

We used a variety of qualitative techniques including participant observation, interviews, and document reviews to investigate the three research questions. The investigation included four B2B e-marketplaces, each with contrasting membership and use levels. Within each e-marketplace, we interviewed executives from organizations buying and selling over the e-marketplace and organizations with high and low use levels. We also interviewed at least one organization that chose not to participate in each B2B e-marketplace. We interviewed nearly fifty executives.

We analyzed the interview data using line-by-line analysis, advocated in grounded theory. By assimilating the stories from many different managers, we identified factors influencing B2B e-marketplace membership and use. This resulted in

three research models. Each model provides data-driven insight into each research question. Research model one explains what factors drive organizations to join B2B e-marketplaces. Research model two explains what factors drive a B2B e-marketplace's use. Research model three explains organizational characteristics affecting a particular organization's B2B e-marketplace use.

These theoretical models enhance management's understanding of e-marketplaces, their role in electronic commerce, and the drivers influencing membership and use. This is important since e-marketplaces offer a number of potential benefits. Yet, many organizations have not joined B2B e-marketplaces and of those that have, few use their services extensively.

From an academic perspective, this research looks at a unique type of interorganizational information system (IOIS). B2B e-marketplaces differ from IOIS discussed in the literature (e.g., EDI) as benefits hinge on obtaining a critical mass of buyers and sellers that use the marketplace. Most IOIS studies focus on information technology connecting two organizations, or one organization and its stakeholders. Given the existence of the technological infrastructure enabling B2B e-marketplaces and the anticipated benefits of e-marketplaces, this type of IOIS will become more predominant in practice. The literature reviews indicate very little academic research on B2B e-marketplaces in general and B2B e-marketplace membership and use drivers in particular. This is one of the first academic studies addressing this emerging IOIS trend. This research identifies implementation challenges and ways of overcoming these challenges.

The theoretical models developed in this research are supported by several well-accepted economic and organizational theories including transaction cost economics, institutional theory, resource dependency theory, and public goods theory. In addition, the theoretical models also identify specific areas in which the existing theories are incomplete and require further development.

### **1. 3. DISSERTATION GUIDE**

This dissertation has ten chapters and three appendices.

Chapters II and III contain literature reviews. Chapter II reviews the B2B e-marketplace research. Since little research exists in this area, Chapter III reviews the IOIS technology adoption and use literature. The research methodology is discussed in Chapter IV. Based on a preliminary field note analysis, Chapter V presents three diagrams guiding the structured interview portion of the field research. Chapter VI describes the four B2B e-marketplaces in this study. The dissertation uses pseudonyms instead of the companies' actual names.

Chapters VII, VIII, and IX discuss the research findings. Chapter VII presents marketplace membership drivers. Chapter VIII examines marketplace characteristics driving B2B e-marketplace's use. Chapter IX discusses organizational characteristics impacting an organization's B2B e-marketplace use. The research conclusions, including a summary, contributions, limitations, and future research, are in Chapter X.

Appendix A presents interview guides for marketplaces, member organizations, and nonmember organizations. Appendix B presents a confessional account of obtaining entrée to the organizations in this study. Appendix C defines acronyms used in the dissertation.

## **CHAPTER II**

### **BUSINESS-TO-BUSINESS ELECTRONIC MARKETPLACE**

#### **LITERATURE REVIEW**

Business-to-business (B2B) electronic marketplaces (e-marketplaces) have been in the limelight since 1999 with the commercialization of the Internet and subsequent “dot.com” boom. However, Malone et al. (1987) discussed this concept years before, recognizing technology advances would soon allow multiple buyers and sellers to link via electronic communication networks. As part of our B2B e-marketplace research, this chapter reviews the B2B e-marketplace literature. The chapter contributes to theory by providing an overview of work in the B2B e-marketplace field and providing a model organizing the B2B e-marketplace literature.

The twenty-five B2B e-marketplace papers reviewed fit into life cycle stages, commonly discussed in systems development (Whitten et al. 2001). Whitten et al. divide an information system life cycle into system development and system operation and support. The authors explain that systems are built, implemented, used, evaluated, and rebuilt. The primary distinction between the model and the systems life cycle is that the life cycle emphasizes design and the model does not. We did not find literature discussing B2B e-marketplace design. In addition, while conducting case study research on two B2B e-marketplaces, we inquired about the role of system design in marketplaces. The respondents purchased packaged marketplace software and explained system design is a minimum criterion necessary for B2B e-marketplace functionality.

We organize the literature review into idea, implementation, use, and evaluation stages. Work in the idea stage includes B2B e-marketplace anticipated benefits and impacts. Work in the implementation stage includes implementation advice, implementation decisions, and implementation challenges. Once systems are implemented, organizations begin using them. Work in this stage includes B2B e-marketplace effects and categories. The use stage is followed by an evaluation stage, where organizations measure impacts and make improvements. Since organizations are

still struggling with implementation, more research is needed in implementation, use, and evaluation.

We posit Figure 3 as a conceptual model of the B2B e-marketplace research.

**Figure 3 Conceptual Model of B2B E-marketplace Research**

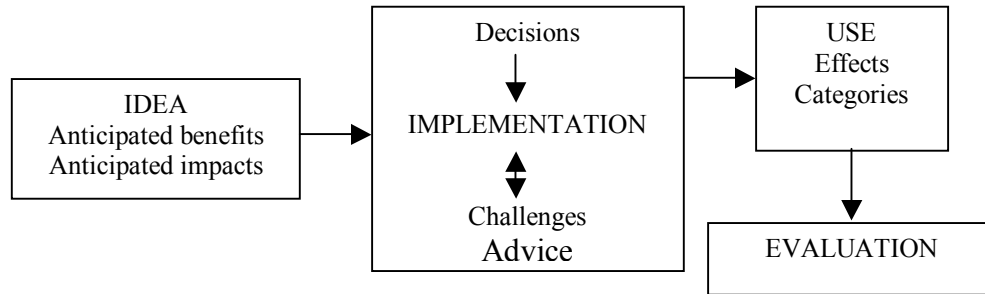


Table 1 categorizes the reviewed literature by author, life cycle stage, focus, theoretical approach, and method. The paragraphs below discuss work in each stage

**Table 1 B2B E-marketplace Literature**

Author	Life Cycle Stage	Focus	Theoretical Approach	Method
1. (Arvin et al. 2002)	Implementation	Helps B2B e-marketplace makers understand emerging best practices; helps potential participants determine functionality to seek from B2B e-marketplaces	None	Case study
2. (Bailey and Bakos 1997)	Use	Investigates how intermediaries benefit participants in electronic markets by reducing transaction and coordination costs	Electronic markets	Case study

**Table 1 Continued**

Author	Life Cycle Stage	Focus	Theoretical Approach	Method
3. (Bakos and Brynjolfsson 1993)	Idea	Explains why the number of suppliers used by a buyer have declined when theory predicts the opposite when information technology is used	Incomplete contracts	Mathematical modeling
4. (Bakos 1991)	Idea	Examines how prices, seller profits, and buyer welfare are affected by reducing search costs in commodity and differentiated markets	Economic	Author's opinion and literature review
5. (Bakos 1997)	Idea	Analyzes electronic market impacts by focusing on buyer search cost reduction	None	Mathematical modeling
6. (Bakos 1998)	Idea	Explains how the Internet affects markets	None	Author's opinion and literature review
7. (Bannan 2001)	Use	Describes e-marketplaces, current status, successful e-marketplaces, and unsuccessful e-marketplaces	None	Author's opinion and literature review
8. (Andrew et al. 2000)	Idea, Implementation, Use	Provides advice on realizing the benefits of, creating value with, and choosing marketplaces. Discusses types of marketplaces	None	Survey, interviews, and public data analysis
9. (Brunn et al. 2002)	Implementation	Defines setting up B2B e-marketplaces to meet challenges and achieve success	Temple framework	Literature review, theory development, and case study

**Table 1 Continued**

Author	Life Cycle Stage	Focus	Theoretical Approach	Method
10. (Chircu and Kauffman 2000)	Use	Develops an intermediation, disintermediation, and reintermediation framework explaining electronic markets' long-term effects	Electronic markets, resource dependency theory, and appropriability of innovation value	Literature review and case study
11. (Choudhury 1998)	Idea, Implementation	Explains when buyers use electronic markets and how electronic markets affect prices, inventory levels, and broker roles	Electronic markets	Case study and survey
12. (Christiaanse and Markus 2002)	Idea	Describes B2B e-marketplace channel structure, including antecedents and consequences	Transaction cost theory, strategic networks theory, marketing channel theory, and political economy theory	Literature review
13. (Dai and Kauffman 2000)	Implementation	Motivators for buyers to move from extranets to electronic markets	Electronic markets	Mathematical modeling
14. (Dai and Kauffman 2001)	Use	Motivators for various online business models and purchasing firms' adoption requirements	Electronic markets	Set of mini cases from a review of websites
15. (Gulledge 2002)	Use	Inhibitors to supplier marketplace adoption and proposal for an improved marketplace	None	Author's experience and literature review
16. (Kaplan and Sawhney 2000)	Use	Identifies 4 electronic marketplace business models	None	Author's opinion and literature review



**Table 1 Continued**

Author	Life Cycle Stage	Focus	Theoretical Approach	Method
17. (Klueber et al. 2001)	Implementation	Proposes a procedure to analyze the potential for partnering with an electronic marketplace	None	Action Research
18. (Lee and Clark 1996b)	Implementation	Explains B2B e-marketplace adoption in terms of drivers, barriers, and overcoming barriers	Business process reengineering perspective	Case study
19. (Lee and Clark 1996a)	Idea, Implementation	Analyzes electronic market implementation impact on search, price discovery, and trade settlement	Economics	Author's opinion and literature review
20. (Malone et al. 1987)	Idea, Implementation	Explains information technology advances' effect on firms and market structures	Transaction cost economics	Author's opinion and literature review
21. (Memishi 2001)	Implementation, Use	Describes B2B EC exchanges current status including problems and success factors	None	Author's opinion and literature review
22. (Senn 1996)	Implementation, Evaluation	Helps managers evaluate electronic markets	None	Author's opinion and literature review
23. (Soh and Markus 2002)	Use	Proposes a strategic archetype approach for classifying B2B e-marketplaces	Strategic positioning theory	External data review
24. (Tumolo 2001)	Idea, Implementation, Use	Discusses B2B exchange issues, including status, types of, success factors, and failure factors	None	Author's opinion and literature review
25. (Yoo et al. 2001)	Use	Compares electronic B2B marketplaces with different ownership structures	None	Empirical

## 2. 1. IDEA

Malone et al.'s (1987) prediction that with the presence of electronic communication technologies, electronic markets would become the favored mechanism for coordinating material and information flows among organizations launched work addressing the B2B e-marketplace idea. Malone et al.'s prediction is known as the **electronic markets hypothesis**. Later, Bakos (1998) explains the functions of electronic markets as matching buyers and sellers, facilitating transactions, providing institutional infrastructure, aggregating product information, price discovery, and providing procurement and industry specific expertise. Bakos explains marketplace members can include buyers, sellers, technology providers, and investors.

The idea stage is characterized by organizations learning about B2B e-marketplaces and gathering information to make informed implementation decisions. “Anticipated benefits” and “anticipated impacts” research streams make up the idea stage.

### 2.1.1. Anticipated Benefits

“Anticipated benefits” is defined as expected advantages from e-marketplace use. Bakos (1998) identifies electronic market benefits with regard to product, price, and transaction cost.

Electronic markets offer three advantages for products. First, electronic markets allow increased personalization and customization of product offerings. For example, delivering electronic magazines customized to each individual reader's preferences. Second, electronic markets allow aggregation and disaggregation of information-based product components. For example, making individual software applets available as needed rather than the entire software package. Third, electronic markets lower search costs for buyers shopping for products and communication costs for sellers communicating information about products. For example, a buyer searching for hotels

and airline tickets can compare the prices of different sellers by using a specialized search engine like Expedia ([www.expedia.com](http://www.expedia.com)).

Electronic markets offer price advantages. First, they allow buyers to make offers and electronically negotiate prices, changing the microstructure of markets. Second, they enable tracking customers' information via data warehousing and data mining, facilitating customized pricing. Third, they facilitate increased information sharing and communication between buyers and sellers, enabling price discrimination. Price discrimination includes charging different prices to different consumers in different situations.

Since electronic markets improve information sharing between buyers and sellers, they reduce order execution costs. Decreased costs can occur in logistics, transportation, distribution, inventory, and payment systems.

A Boston Consulting Group report (Andrew et al. 2000) outlines nine electronic market value creation sources. These include: aggregation, process automation, transparency/auctions, lower marketing and sales costs, lower transaction costs, lower inventory costs, lower cycle time, and improved asset utilization. The report divides value creation sources into value shift activities and value creation activities.

#### 2.1.2. Anticipated Impacts

B2B e-marketplace anticipated impacts research considers how B2B e-marketplaces will affect varying business aspects. Most work in this area is based on Malone et al.'s (1987) electronic markets hypothesis derived from transaction cost economics. However, Christiaanse and Markus' (2002) work considers four other theoretical explanations enhancing the transaction cost economics perspective on B2B e-marketplace impacts. First, we discuss work focusing on the electronic markets hypothesis, followed by work addressing other B2B e-marketplace impacts.

Malone et al.'s (1987) electronic markets hypothesis posits electronic markets will impact communication, brokerage, and integration. In the paragraphs below we discuss these impacts, along with work in the area.

The **electronic communication effect** posits electronic markets will lower communication costs, enable electronic demand and supply aggregation, and enhance a firm's ability to more closely coordinate its economic activity. Bakos'(1991) opinions support the existence of an electronic communication effect. His article considers electronic market implications; particularly, how improved price dissemination will affect buyers and sellers. Bakos posits increased communication is likely to reduce seller profits and increase buyer welfare, especially in commodity markets. In addition, he suggests sellers control how markets evolve in order to protect profits. The best case for sellers is markets providing product information.

Testing the electronic communication effect, Bakos (1997) uses mathematical modeling to show reduced search costs in a differentiated market with heterogeneous buyer tastes and seller product offerings, impact market equilibrium, resulting in increased efficiency, possibly lower prices, and increased seller competition. Choudhury (1998) proposes electronic markets will lower prices (1) in commodity markets, and (2) in markets with differentiated products if the system supports selection with price information. Electronic markets will not lower prices if the market is differentiated and the system supports only identification with product information. Choudhury also proposes electronic markets will lower buyer inventory levels.

The **electronic brokerage effect** predicts electronic communication technologies will enable technologically capable intermediaries to replace traditional middlemen and reduce transaction costs. Within this stream, Choudhury's (1998) research proposes electronic markets will reduce buyer broker use. However, Lee and Clark (1996a) posit the introduction of electronic brokerage systems may transform direct search markets into brokered markets. They also posit electronic auction systems implemented in intermediary markets can create new auction forms. Bailey and Bakos' (1997) case studies find markets do not become disintermediated with information technology-facilitated transactions. The authors identify several new roles for electronic intermediaries. These include aggregating, matching suppliers and customers, and providing trust and interorganizational market information.

The **electronic integration effect** predicts electronic communication technology will enable suppliers and buyers to use information technology to create joint, interpenetrating processes. In support of this effect, Malone et al. (1987) posit electronic markets may become more like electronic hierarchies. The authors explain since electronic communication technology enables sharing databases and integrating physical and electronic processes, their implementation will be customized to the buyer-supplier relationship (physical, human, and time). This increased integration will lead to hierarchical rather than market relationships. Showing a relationship between electronic markets and decreased suppliers, Bakos and Brynjolfsson's (1993) work supports this idea. Bakos and Brynjolfsson find information technology increases the importance of noncontractible investments by suppliers (e.g., quality, responsiveness, and innovation) and when these investments are important, firms use fewer suppliers.

A few researchers posit electronic market impacts that do not fall in the above categories.

Based on the literature, Christiaanse and Markus (2002) explain potential B2B e-marketplace impacts using four theories: transaction cost, strategic networks, marketing channel, and political economy. The authors put forth decision-making structure, relational integration, and ownership structure as B2B e-marketplace channel structure dimensions. The model posits internal economy, internal polity, external economy, and external polity influence channel structure. Channel structure consequences include economic performance and polity performance. Economic performance includes efficiency measured as inventory turnover and profit margin and effectiveness measured as adaptiveness and innovativeness.

Tumolo (2001) posits buyers changing suppliers in order to buy through the marketplace may get poor product performance, especially when buying critical parts or components. In the case of suppliers, marketplaces may dominate over other selling channels and cause suppliers that do not join the right marketplace to miss sales.

## 2. 2. IMPLEMENTATION

The model posits anticipated benefits led to decisions to implement B2B e-marketplaces. We define implementation as making efforts to adopt and use an e-marketplace. In this section, we discuss three B2B e-marketplace implementation research streams: decisions, challenges, and advice.

### 2.2.1. Implementation Decisions

Several research articles investigate B2B e-marketplace implementation decisions. We define implementation decision as an organization choosing to adopt and try to use a B2B e-marketplace.

Malone et al. (1987) investigate buyer and supplier motives for joining electronic markets. They find that buyers and suppliers have different motives for joining electronic markets. Suppliers join electronic markets because they want buyers to purchase their product rather than competitors. Buyers join electronic markets to increase numbers of alternative suppliers and to better compare alternatives.

In a case study of four B2B e-marketplaces, Lee and Clark (1996b) take a business process reengineering perspective to investigate economic forces driving B2B e-marketplace adoption. Lee and Clark identify efficiency and effectiveness increases in information gathering, contract formation, and trade settlement as primary determinants of B2B e-marketplace adoption by market-making firms.

Choudhury (1998) investigation of when buyers use electronic markets finds that buyers use electronic markets to purchase products low in asset specificity and description complexity. Dai and Kauffman (2000) investigate factors motivating buyers to move from an extranet, an internal network accessible to authorized outsiders, to an electronic market. Dai and Kauffman find a buyer's decision a function of desired gains from lower search and operation costs enabled by an electronic market, importance of information sharing between suppliers, level of competition in the supplier market, and desired levels of supplier-specific relationship investments. Senn (1996) posits

organizations participate in electronic markets to create products, deliver services, and reach potential customers.

Drawing on his experience, Gulledge (2002) considers suppliers' B2B e-marketplace adoption decisions. Gulledge explains supplier reluctance in adopting B2B e-marketplaces as a function of profit and technology squeeze. The profit squeeze points out that B2B e-marketplaces are likely to reduce supplier profit margins since their value proposition is reducing supply chain costs. The technology squeeze explains that suppliers are likely to have to participate in multiple B2B e-marketplaces, each with slightly different technical interfaces.

#### 2.2.2. Implementation Challenges

Several authors discuss B2B e-marketplace implementation challenges. We define implementation challenges as difficulties organizations have in trying to use the e-marketplace they have chosen to adopt. These challenges include attaining a critical mass of buyers and sellers, guaranteeing promises made on the marketplace, and integrating marketplaces with existing systems.

Using a resource dependency perspective, Lee and Clark (1996b) identify and explain B2B e-marketplace implementation challenges based on four B2B e-marketplace case studies. The authors identify the following barriers to B2B e-marketplace adoption: uncertainty associated with describing electronic products, risk associated with doing business using a new system that may not attract a critical mass of buyers and sellers, and change resistance associated with an unwillingness to give up large investments in existing infrastructure.

Critical mass involves attracting enough buyers and sellers to use and financially sustain the marketplace. Lee and Clark explain firms adversely affected by electronic markets will resist implementing the marketplace, and thus prevent achieving critical mass. Tumolo (2001) cites critical mass as a hurdle for organizations implementing B2B EC exchanges.

Guaranteeing purchased products will be the right product delivered at the right time is also an implementation challenge for B2B e-marketplaces. Several authors

discuss this. Lee and Clark (1996a) posit the need for product rating standards and a trusted third party for product evaluation. In a description of problems with exchanges, two articles (Memishi 2001, Rajkumar 2001) cite a lack of uniform data description standards explaining that most organizations will want to participate in multiple exchanges and the different ways of describing products must be standardized.

Two articles (Memishi 2001, Rajkumar 2001) explain B2B EC exchanges need to determine how to seamlessly integrate transactions made over the exchange with the organization's existing information systems.

### 2.2.3. Implementation Advice

Several reports offer practitioners advice on implementing B2B e-marketplaces. We define implementation advice as offering suggestions.

A Boston Consulting Group report (Andrew et al. 2000) offers marketplaces and participants advice. The report advises organizations on types of marketplaces to participate in, as well as participation strategies. For marketplaces, the report proposes three major sources of revenue, explaining marketplace revenue will come from services supporting collaboration activities. Marketplaces depending on transaction fees or commerce services for revenue will not survive. The report offers advice for creating viable e-marketplaces.

Klueber et al. (2001) use action research to propose some motivations, a concept, and a procedure for analyzing the potential for partnering with an electronic market. Analysis criteria include: state of control, value chain coverage, market form, strategic fit, revenue generation, and customer incentives.

Brunn et al. (2002) develop the Temple Framework, addressing several B2B e-marketplace implementation aspects. The Temple Framework defines B2B e-marketplace success as profitability and looks at the setup B2B e-marketplaces must create to achieve success. The framework addresses the following aspects of B2B e-marketplace setup: focus, governance, functionality, technology, and partnerships. It identifies building liquidity and capturing value as challenges B2B e-marketplaces need



to address. The framework is based on a synthesis of contemporary B2B e-marketplace research and literature and is supported by a case study of gatetrade.net.

Researchers from McKinsey & Company and CAPS Research (Arvin et al. 2002) develop a report helping exchanges understand and leverage emerging best practices. The report also helps buyers, suppliers, and investors determine functionality to seek from different types of e-supply tools in order to realize supply chain value. The authors define value as revenue, cost, asset utilization, risk, cycle time, quality, and customer service improvement. The study is based on interviews conducted between July and November 2001. The interviews include executives from ten industry-sponsored exchanges and six private exchanges.

### **2.3. USE**

Once organizations overcome implementation challenges, marketplace use begins. Currently, B2B e-marketplace use research includes categories and effects. Since many organizations are still struggling with implementing B2B e-marketplaces, limited research in this stage exists.

#### **2.3.1. Categories**

A popular research stream involves categorizing existing B2B e-marketplaces along varying dimensions. Authors have developed different classification schemes and have classified B2B e-marketplaces based on the ways the different e-marketplaces have developed.

Tumolo (2001) categorizes marketplaces based on whether they focus on multiple industries or a single industry. Tumolo indicates that horizontal and vertical marketplaces exist. Horizontal marketplaces provide many commodity products used across industries (e.g., office supplies). Vertical marketplaces focus on a specific industry and provide members with specialized products, in-depth industry knowledge, and collaboration opportunities. Memishi (2001) posits exchanges focusing on vertical industries are likely to be more successful than those serving a variety of industries, as their expertise will enable awareness of market needs.

The Boston Consulting Group report (Andrew et al. 2000) finds two types of B2B e-marketplaces: private and public. A single buyer or seller drives a private B2B e-marketplace with participation open primarily to the company's suppliers or customers. Industry consortia establish public B2B e-marketplaces, which are open to any industry participant.

Kaplan and Sawhney (2000) identify four B2B e-marketplace business models. These models are classified by type of product and transaction characteristics. MRO (maintenance, repair, and operation) hubs are horizontal markets enabling systematic purchasing of operating supplies. Yield managers are horizontal markets supporting spot purchasing of operating supplies. Electronic catalog hubs operate in vertical markets and provide integrated product information used for repetitive purchasing of manufacturing inputs. Exchange hubs are vertical markets for spot purchasing of manufacturing input.

Dai and Kauffman (2001) use pricing practices and supplier identification practices to categorize B2B e-marketplaces. They posit four B2B e-marketplace types: private aggregation, public aggregation, private negotiation, and public bidding. In private aggregation, buyers purchase large quantities and frequently ordered items from preselected suppliers at fixed prices. In public aggregation, buyers purchase from all possible suppliers at fixed prices. Public aggregation is usually used in fragmented markets and for time critical or small quantity purchases. In private negotiation, buyers procure production inputs using dynamic pricing from prescreened suppliers. In public bidding, buyers identify eligible suppliers from member firms for asset/capacity exchanges.

Dai and Kauffman have three findings with regard to the four B2B e-marketplaces types. First, the electronic markets hypothesis does not predict the private aggregation and matching networks that have arisen on the Internet. In many cases, buyers forgo the benefits from extensive searches in order to engage in closer relationships with fewer suppliers. Second, online B2B e-marketplaces not only enable electronic transactions, they also promote expertise sharing and collaboration among

multiple partners involved in highly complex business processes. This was not entirely foreseen by the theory of electronic markets. Third, current B2B e-marketplaces and electronic procurement solutions fail to deliver sufficient value in the settlement and logistics step of the electronic markets hypothesis.

Ownership structure is another way to categorize B2B e-marketplaces. Marketplaces can be independently owned (neutral) or participant-owned (biased). Memishi (2001) explains organizations do not want to join marketplaces owned by their competitor. Marketplace success hinges on founding organizations distancing themselves from the marketplace by creating an independent ownership structure. As of 2001, independent third party intermediaries run most e-marketplaces (2001).

In contrast to this recommendation, two studies show truly neutral marketplaces may not yield as many benefits as industry-owned marketplaces. Bannan (2001) reports successful B2B e-marketplaces secure most of their funding from companies using them. Yoo et al. (2001) empirically analyzes neutral and biased (buyer-owned and supplier-owned) B2B e-marketplaces. Using price, market share, surplus, social welfare, and competitiveness, the authors find biased B2B e-marketplaces are better than neutral B2B e-marketplaces with regard to total surplus (e.g., cost savings). They also find buyer-owned B2B e-marketplaces generate larger surplus than supplier-owned B2B e-marketplaces.

Soh and Markus (2002) explain empirical classification schemes for B2B e-marketplaces are rich, but fall short offering implied theory explaining outcome differences. The authors propose a strategic archetype approach for classifying B2B e-marketplaces. A strategic archetype is a frequently occurring named grouping of firms with similar configurations of multiple attributes. The approach is based on strategic positioning theory (Porter 1996), which proposes value proposition, product-market focus, and value activity fit is required for superior performance. The authors review external data (e.g., websites and annual reports) of two successful B2B e-marketplaces in the electronic components industry to illustrate the strategic archetypes approach.

### 2.3.2. Effects

We define effects as the impacts of B2B e-marketplace use. Two studies investigate B2B e-marketplace effects.

Bailey and Bakos (1997) use thirteen case studies to investigate how intermediaries benefit participants in electronic markets. They find markets do not become disintermediated when information technology is used as a transaction facilitator. The authors identify four new roles for electronic intermediaries: aggregating, matching suppliers and customers, and providing trust and interorganizational market information.

Chircu and Kauffman (2000) develop an intermediation, disintermediation, and reintermediation framework explaining long-term effects of electronic markets. Using this framework in a travel industry field study, the authors show traditional travel agents will avoid disintermediation and remain profitable in the long run.

## 2.4. EVALUATION

Organizations must evaluate their e-marketplace endeavor. We define evaluation as assessing marketplace operations, impacts, and improvement opportunities. Evaluation occurs before and after implementation decisions. Little work exists in this area because most marketplaces are still struggling with implementation.

Senn (1996) posits evaluating an electronic market's potential based on the following benefits: extending reach, bypassing traditional channels, augmenting traditional markets, boosting service, and advertising. Senn also posits evaluating electronic market projects with benchmarks and timetables.

## 2.5. B2B E-MARKETPLACE LITERATURE SYNOPSIS

This chapter reviews B2B e-marketplace literature and develops a conceptual model, Figure 3, showing B2B EC research falls into some stages of the system life cycle. Table 1 categorizes the reviewed literature by author, life cycle stage, focus, theoretical approach, and method. The paragraphs below discuss work in each stage.

Early B2B e-marketplace work recognizes information technologies' potential of linking multiple buyers and sellers. Most work focuses on B2B e-marketplace idea and implementation stages. Very little research addresses B2B e-marketplace use or evaluation.

Theoretical approach refers to concepts underpinning the investigation. The electronic markets hypothesis and transaction cost economics are dominant theoretical underpinnings in B2B e-marketplace research.

The electronic markets hypothesis (Malone et al. 1987) predicts electronic markets will be the favored mechanism for coordinating material and information flows among organizations in the presence of electronic communication technologies. Transaction cost economics (Williamson 1979, Williamson 1982, Williamson 1985, Williamson 1994, Williamson and Ouchi 1981) forms the basis of the electronic markets hypothesis. Transaction cost economics posits an organization's goal is to minimize the cost of exchanging resources in the environment and the costs of managing exchanges inside the organization. Table 1 indicates that most B2B e-marketplace research is based on the author's opinion and a literature review. The area needs more empirical research.

# **CHAPTER III**

## **INTERORGANIZATIONAL INFORMATION SYSTEMS**

### **ADOPTION AND DIFFUSION LITERATURE REVIEW**

#### **3. 1. INTRODUCTION**

This dissertation investigates business-to-business (B2B) electronic marketplace (e-marketplace) membership and use drivers. Part of this process requires being aware of existing literature and how this research's findings compare and contrast to previous work. Chapter II reviewed the B2B e-marketplace literature. This provided some background on B2B e-marketplaces and indicated gaps in the research stream. The literature has investigated aspects of B2B e-marketplace membership and use drivers on a limited basis. As such, this chapter broadens the literature review. B2B e-marketplaces are a type of interorganizational information system (IOIS). Membership and use are aspects of adoption and diffusion. The paragraphs below review the IOIS adoption and diffusion research.

Bursting onto the business scene in the 1980s, IOIS have sparked academic and practitioner interest. Practitioners experience implementation success and failure, while academics (Kauffman and Walden 2001) research a variety of areas, including predicting effects, proposing facilitators, and evaluating investments.

The Internet's commercialization in the mid-1990s sparked more interest with practitioners trying to deploy electronic commerce (EC). While there have been many B2B EC success stories (Patton 2001), there have also been many failures (Barlas 2001, Bates et al. 2001, Ericson 2001, Kauffman and Walden 2001) and some reports (Clark 2001) explain B2B EC adoption has been much slower than anticipated.

Before IOIS, particularly EC, will change society or work practices, these technologies must be adopted and diffused. What facilitates IOIS adoption and diffusion? Chwelos et al. (2001) hypothesize variables at technological, interorganizational, and organizational levels facilitate emerging IOIS adoption.

In an evaluation of Chwelos et al.'s hypothesis, this chapter categorizes variables found to significantly influence adoption and diffusion of various IOIS forms. In this process, we review twenty-seven empirical IOIS adoption and diffusion studies published between 1985-2002. The categorization supports and extends Chwelos et al.'s hypothesis.

The remaining sections of this chapter are organized as follows. Section 3. 2. describes different IOIS types. Section 3. 3. explains IOIS adoption and diffusion research. Section 3. 4. discusses theoretical underpinnings of IOIS research. Section 3. 5. evaluates Chwelos et al.'s (2001) hypothesis by analyzing significant IOIS variables. Section 3. 6. provides concluding remarks.

### **3. 2. INTERORGANIZATIONAL INFORMATION SYSTEMS (IOIS)**

Cash and Konsynski (1985) define an IOIS as a computer and communication infrastructure crossing company boundaries enabling information sharing. Several types of IOIS exist: customer-oriented strategic systems (COSS), electronic data interchange (EDI), B2B electronic commerce (EC), and B2B e-marketplaces. Reich and Benbasat (1990, p. 326) define a COSS as “an information system linking a company to its customers to support or shape the company’s competitive strategy.” Premkumar et al. (1997, p. 108) define EDI as “the direct computer-to-computer communication between an organization and its trading partners of business documents and information in a machine-readable, structured format that permits data to be processed by the receiver without rekeying.” Zwass (1996, p.3) defines B2B EC as sharing business information, maintaining business relationships, and conducting business transactions via telecommunication networks. Bakos (1997, p. 1679) defines a B2B e-marketplace as an IOIS allowing multiple buyers and sellers to exchange prices and product information and execute transactions.

Each IOIS differs slightly from the other. B2B e-marketplaces require a critical mass of buyers and sellers, whereas EDI, B2B EC, and COSS do not. The difference between COSS and EDI is less clear. The main distinction is COSS primarily focuses

on linking a company with its customers and EDI includes other business partners. EDI differs from B2B EC as EDI is a direct connection over a private line and B2B EC can be conducted over the Internet.

Table 2 shows reviewed studies categorized by IOIS type and implementation stage. We review twenty-eight studies. Table 2 shows twenty-nine studies because two studies (Hart and Saunders, 1997, Premkumar and Ramamurthy, 1995) concentrate on both EDI adoption and diffusion. COSS categorizes a variety of studies focusing on customer-oriented information systems.

**Table 2 Summary of 27 IOIS Adoption and Diffusion Facilitator Studies**

TYPE OF IOIS	STUDY		TOTAL
	ADOPTION	DIFFUSION	
COSS	4	1	5
EDI	11	6	17
B2B EC	1	4	5
B2B	1	1	2
Total	17	12	29

Table 2 indicates seventeen of the twenty-seven IOIS studies focus on EDI. Two empirical studies focus on B2B e-marketplace drivers.

### 3. 3. RESEARCH PAPERS

Most researchers (Cavaye and Cragg 1995, Reich and Benbasat 1990, Rogers 1995) agree technology adoption occurs in stages. While a number of stages have been proposed, the most common stages are technology adoption and diffusion. **Technology adoption** is characterized by several actions related to learning about an innovation. These include collecting information, building knowledge, examining relevance, and evaluating appropriateness. Technology adoption culminates in an innovation adoption decision. Rogers (1995) distinguishes between technology adoption and diffusion since it is possible for an organization to adopt an innovation and not use it.



**Technology diffusion** involves an innovation's implementation and use spreading over a period of time. Technology diffusion studies focus on why and how an innovation's use spreads and innovation characteristics leading to widespread acceptance. In many diffusion studies use is the dependent variable. Table 3 notes these studies. Table 3 categorizes IOIS research focusing on technology adoption and technology diffusion. We organize the table alphabetically by author.

**Table 3 Interorganizational Information Systems Technology Adoption and Use Facilitator Literature**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
1. (Bouchard 1993)	Key business partner implementation, use, and/or mandates	EDI adoption	Survey of 175 retail suppliers, 2 retail supplier case studies, and 10 computer-supported interviews of retail suppliers	Innovation diffusion theory and critical mass theory
2. (Cavaye and Cragg 1995)	Technology opportunity, good marketing programs, and user technology awareness	Customer-oriented IOIS adoption	9 case studies of profit-oriented firms selling a product/service	None
3. (Chwelos et al. 2001)	External pressure, perceived benefits, and readiness	EDI adoption intention	Survey of 268 small to medium organizations in the Purchasing Managers Association of Canada	Critical mass theory, innovation diffusion theory, and power

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
4. (Cox and Ghoneim 1996)	Coherent strategy, top management support, adding value, review, continuous improvement, and core business activity integration	EDI implementation and EDI integration benefits and barriers	Survey of 85 organizations representing a variety of industries and 1 case study	None
5. (Crook and Kumar 1998)	Organizational context (organizational size, information technology capability, senior management commitment), environmental context (industry experience with EDI, nature of suppliers and customers, customer facilitated use), external pressure, system benefits, and implementation support	EDI Use	Case study using grounded theory of 4 organizations in 4 different industries	None
6. (Damsgaard and Lyytinen 1998)	Interorganizational collaboration, herd effect, environment favoring cooperation, trade organization support, and infrastructure	EDI diffusion	Field study of 9 organizations from 3 industries in Finland	Institutional theory and innovation diffusion theory

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
7. (Deeter-Schmelz et al. 2001)	Supplier support and technology communication convenience	B2B EC adoption	Survey of 222 members of the National Association of Purchasing Managers	Innovation diffusion theory
8. (Grewal et al. 2001)	Emphasizing efficiency motivations, deemphasizing legitimacy motivations, and information technology capabilities	B2B e-marketplace use	Survey of 306 participants in the Polygon marketplace	Institutional theory, transaction cost theory, and motivation-ability framework
9. (Grover 1993)	Top management support, champion existence, compatibility, complexity (less), recognizing information technologies' integral role, large size, strong in-house information technology infrastructure, strategic information systems planning, aggressive management willing to take risks, aggressive technology policy, and participatory decision-making	Customer-based IOIS adoption	Survey of 226 senior executives	None

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
10. (Han and Noh 1999-2000)	Inhibitors: system stability, data security, inconvenient use, unsatisfactory purchases, and social disturbance	B2B EC diffusion	Survey of 325 people with EC experience	None
11. (Hart and Saunders 1997)	Power	EDI adoption	Theoretical framework and case study of a retail firm	Power
12. (Hart and Saunders 1997)	Trust	EDI use	Theoretical framework and case study of a retail firm	Power
13. (Hope et al. 2001)	Clear e-business vision, customer readiness and technological awareness, top management support, creative managerial thinking, information sharing and open communication, system marketing and promotion, staff skilled in technical and business issues, appropriate timing of project start up, clear and certain legislative and policy environment, current technology, and external expertise	B2B EC diffusion	Case study of 5 medium-sized companies in the transportation and logistics industry of New Zealand	None

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
14. (Iacovou et al. 1995)	Perceived benefits and external pressure	EDI adoption by small organizations	Case study of 7 managers of small organizations	Innovation diffusion theory and resource dependency theory
15. (Lee and Clark 1996b)	Facilitators: increased efficiency and effectiveness; barriers: uncertainty, risk, and change resistance	B2B e-marketplace adoption	Case study of 4 B2B e-marketplaces	Business process reengineering perspective
16. (O'Callaghan et al. 1992)	Perceived relative advantage	EDI computer based interface offerings adoption decision	10 field interviews, 1 focus group, and a survey of 1242 members of the Independent Insurance Agents of America	Innovation diffusion theory
17. (Premkumar and Ramamurthy 1995)	Internal need, top management support, competitive pressure, and exercised power	EDI adoption decision modes (proactive vs. reactive)	Survey of information systems and sales/purchasing executives from 201 firms	Power and social exchange theory
18. (Premkumar and Ramamurthy 1995)	Proactive adoption	EDI diffusion defined as adaptation, connectivity, and integration	Survey of information systems and sales/purchasing executives from 201 firms	Power and social exchange theory
19. (Premkumar et al. 1994)	Relative advantage, technical compatibility, low cost, and duration	EDI adaptation, internal diffusion, and external diffusion	Survey of information systems and sales/purchasing executives from 201 firms	Innovation diffusion theory

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
20. (Premkumar et al. 1997)	Firm size, top management support, competitive pressure, and customer support	EDI adoption	Survey of 181 firms in the trucking industry	Innovation diffusion theory and resource dependency theory
21. (Ramamurthy et al. 1999)	Facilitators: Internal support, benefit potential, compatibility, customer support, and competitive pressure; inhibitor: resource intensity	EDI diffusion defined as internal and external integration	Field survey of 83 firms in the motor carriers industry	Sociopolitical process framework, organizational theory, innovation diffusion theory, use of information technology for competitive advantage, and information systems implementation
22. (Ranganathan et al. 2001)	Top management support, organizational change, strategy, project management, valuation, internal information technology, external information technology, collaboration, and external business environment	B2B EC deployment	Survey of 100 firms in Singapore and case studies with information technology executives	Innovation diffusion theory

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
23. (Reich and Benbasat 1990)	Product champion, top management support, proactive information systems function, external pressure, customer involvement, system marketing, and expressed customer need	Customer-oriented strategic system adoption	Case study of 11 customer-oriented strategic systems, interviews with line and information systems management	None
24. (Runge 1985, Runge 1988)	Product champion, customer involvement in development process, marketing efforts, extension of existing information systems, and ignoring or circumventing normal information system planning and approval processes	Telecommunication-based information system adoption	Case study of 35 systems in Britain	None
25. (Sabherwal and Vijayasathya 1994)	Product information intensity, value chain information intensity, and environmental uncertainty	Telecommunication use between customers and suppliers	Survey of 86 senior executives from medium-sized companies	None
26. (Saunders and Clark 1992)	Perceived cost	EDI adoption	Surveys of 192 vendors	Power

**Table 3 Continued**

Author	Facilitators of Adoption and Diffusion (Significant Independent Variables)	Adoption/ Diffusion Phenomenon (Dependent Variable)	Source of Data	Theoretical Base
27. (Tabor 2001)	Customer-	B2B EC use	Case study of a major U.S. airline	None
28. (Teo et al. 1995)	Complexity, operational risk, strategic risk, and observability	EDI adoption intention	112 surveys from senior management of firms listed in the Singapore stock exchange	Innovation diffusion theory
29. (Williams 1994)	Demand uncertainty, power, and relative advantage	EDI adoption	Interviews and 156 surveys from customers, suppliers, shippers, and carriers, who are members of the Council of Logistics Management	Organizational theory and power theory



### 3.3.1. Intent to Adopt/Adoption

In this section, we discuss research focusing on facilitators of IOIS adoption and/or adoption intentions. We organize the section by IOIS type discussing earlier IOIS types first.

#### 3.3.1.1. Customer-oriented Strategic Systems (COSS)

This section discusses research focusing on different types of customer-oriented interorganizational systems. Authors use a variety of names for variations of customer focused IOIS. We use the term customer-oriented strategic systems in referring to these studies. However, in discussing individual studies, we use the term the authors use.

Runge (1985) investigates factors facilitating adoption and acceptance of telecommunication-based interorganizational systems using a case study method. His interviews are based on a literature survey and include businesses and technical managers of thirty-five different telecommunication-based information systems. Runge finds five factors consistently mentioned as important in IOIS acceptance and adoption. These include product champions, customer involvement in the development process, system marketing, existing information system extension, and normal information systems planning and approval process circumvention.

Reich and Benbasat (1990) investigate factors facilitating system development, high adoption rate, and competitive advantage using eleven customer-oriented strategic system case studies. Reich and Benbasat find champion existence, top management support, proactive information systems function, external pressure, marketing the system, customer involvement, and expressed customer need facilitate adoption.

Grover (1993) investigates factors facilitating customer-based interorganizational system adoption. Using a survey, Grover finds proactive technological orientation and internal push factors facilitate adoption. Proactive technological orientation contains variables indicating technological sophistication. These include engaging in strategic information systems planning, recognizing information technologies' integral role, having a strong in-house information technology infrastructure, having aggressive management willing to take risks, having an aggressive technology policy, and

encouraging participatory decision-making. Internal push measures organizational support for customer-based interorganizational systems. Sustained and active top management support and champion existence comprise internal push. The study also finds compatibility and large organization size facilitates adoption; complexity inversely relates to adoption.

Cavaye and Cragg (1995) use case studies to investigate factors facilitating stages in the customer-oriented strategic systems development cycle. We include this study in the adoption literature because three of the four stages relate to adoption. The third stage's dependent variable is adoption rate in the first year, and entering this stage is contingent upon completion of the first two stages. The fourth stage focuses on obtaining benefits from the IOIS, with dependent variables including increased sales and increased user satisfaction. This stage is not discussed in the literature review.

Cavaye and Cragg show technology opportunity, good marketing programs, and user technology awareness strongly relate to technology adoption. Technology opportunity has a strong relationship with identifying system opportunities. Good marketing programs and user technology awareness enable first year system adoption. Several variables have mixed relationships with technology adoption. Competitive pressure has mixed results as an IOIS opportunity identification facilitator. Champion existence, extending existing systems beyond company boundaries, and experienced information systems staff have mixed results as IOIS building facilitators. The system being built in reaction to expressed customer needs, user participation, and low system costs have mixed results as first year IOIS adoption facilitators.

#### 3.3.1.2. Electronic Data Interchange (EDI)

This section discusses studies examining EDI adoption.

Surveying one hundred and ninety two vendors, Saunders and Clark (1992) find perceived EDI cost reduces adopt intentions.

Using field interviews, a focus group, and a survey, O'Callaghan et al. (1992), investigate factors affecting decisions to adopt insurance carriers' EDI computer-based interface offerings. Using insights from innovation theory, the authors find a positive

relationship between perceived relative advantage of EDI over present systems and adoption decisions.

Bouchard (1993) uses a survey, case study, and computer-supported interviews to investigate decision criteria for organizational EDI adoption. Supporting critical mass theory, Bouchard finds key business partner adoption, use, and/or mandates influence organizational EDI adoption decisions. Bouchard finds characteristics associated with innovation diffusion theory moderately influence EDI adoption decisions.

Williams (1994) uses interviews and surveys to investigate factors influencing EDI adoption in distribution channels. The authors interview transaction channel firms, marketing channel firms, consultants, and EDI third-party providers to verify investigated variables. Upon determining variables to investigate, one hundred fifty six members of the Council of Logistics Management completed questionnaires. The questionnaires show different influence variables for each channel type. In marketing channels, organizations adopt EDI to reduce demand uncertainty. In logistical channels, carriers adopt EDI because shippers request or force them. However, some carriers adopt EDI because of its relative advantage. Organizational theory and power theory form the theoretical base of William's work.

Iacovou et al. (1995) develop and empirically test an EDI adoption framework for small businesses. The model's independent variables include perceived benefits, organizational readiness, and external pressure. EDI adoption, EDI integration, and EDI impact are dependent variables. Their case study has several findings. A moderate relationship exists between perceived benefits and EDI adoption and integration, moderately supporting diffusion of innovation theory. Promotion increased benefits awareness. A moderate relationship exists between readiness and integration. Third, the relationship between external pressure (operationalized as dependency) and adoption is strong. This offers strong support for resource dependency theory, even though the authors did not mention this theory.

Teo et al. (1995) investigate factors affecting an organization's EDI adoption intention using a survey. Factors investigated come from innovation diffusion theory

and include relative advantage, compatibility, complexity, observability, trialability, and risk (operational and strategic). The authors find present adoption intention dependent on complexity, operational risk, and strategic risk. Low complexity, low operational risk, and low strategic risk are associated with high present adoption intention. Future adoption intention is contingent upon complexity, observability, and strategic risk.

Premkumar et al. (1997) examine EDI adoption in the European trucking industry using a field survey. Using discriminant analysis, the authors find two organizational factors (firm size and top management support) and two interorganizational factors (competitive pressure and customer support) separate adopters from non-adopters. Specifically, competitive pressure is the most important adoption facilitator. Customer support was second. Customer support involves larger companies helping small companies that they do business with adopt EDI. Help includes providing smaller companies training programs, software, and incentives. The study finds larger companies more likely to adopt EDI than smaller companies. Innovation diffusion theory and resource dependency theory form the study's theoretical basis.

Damsgaard and Lyytinen (1998) use a field study to investigate typical EDI diffusion patterns in Finland; how organizational, industry, and environmental factors affect these patterns; and various diffusion pattern success rates in EDI institutionalization. The authors examine adoption patterns at three levels to develop diffusion patterns. The authors believe innovation diffusion theory does not explain their findings. Innovation diffusion theory focuses on technical features and individual adopters as adoption explanations. Damsgaard and Lyytinen's findings link successful EDI diffusion in Finland to a blend of institutional, technological, socio-economic, and cultural issues. In the study, collaboration, cooperation, trade organization support, infrastructure, and the herd effect increase diffusion. The herd effect refers to EDI adoption fueled by others' adoption.

Chwelos et al. (2001) use a survey testing readiness, perceived benefits, and external pressure as EDI adoption intention determinants. The study finds all three

factors significant predictors of EDI adoption intention. However, external pressure and readiness influence EDI adoption intention more than perceived benefits. Critical mass theory, innovation diffusion theory, and power theory form the authors' theoretical base.

#### 3.3.1.3. Business-to-Business (B2B) Electronic Commerce (EC)

One study discusses B2B EC adoption. Deeter-Schmelz et al. (2001) use a survey to test the impact of supplier support and technology communication convenience on buyer Internet adoption for corporate purchasing activities. The study finds supplier support directly affects Internet purchase intent and communication convenience impacts both buyer adoption behavior and Internet purchase intent. Innovation diffusion theory forms the study's theoretical underpinnings.

#### 3.3.1.4. Business-to-Business (B2B) Electronic Marketplaces (E-marketplaces)

Taking a business process reengineering perspective, Lee and Clark (1996b) use four B2B e-marketplace case studies to investigate forces driving and barriers to B2B e-marketplace adoption. The authors use throughput growth rate to measure adoption. The authors find increased efficiency and effectiveness in information gathering, contract formation, and trade settlement drive B2B e-marketplace adoption. The authors identify the following adoption barriers: uncertainty describing electronic products; risk doing business in a new way that may not attract a critical mass of buyers and sellers; and change resistance associated with replacing large investments in existing infrastructure.

### 3.3.2. Diffusion

This section chronologically discusses IOIS diffusion facilitator research.

#### 3.3.2.1. Customer-oriented Strategic System (COSS)

Sabherwah and Vijayasathy (1994) use a survey to investigate the effects of environmental uncertainty, product information intensity, value chain information intensity, and information systems maturity on customers and supplier telecommunication link use. The study also investigates how these links impact organizational performance. Porter and Millar (1985) define product information intensity as the degree the organization's customers utilize information for selection,

purchase, use, and maintenance of its products or services. The authors define value chain information intensity, as degree the organization requires information to acquire, manufacture, distribute, sell, and maintain its products or services.

The authors find a positive association between product information intensity, value chain information intensity, and environment uncertainty and telecommunication link use by and customers and suppliers.

#### 3.3.2.2. Electronic Data Interchange (EDI)

Using innovation diffusion theory, Premkumar et al. (1994) investigate the relationship between various innovation characteristics (complexity, compatibility, costs, relative advantage, and communicability) and several diffusion attributes (adaptation, internal diffusion, external diffusion, and implementation success) in EDI organization. Based on surveys from two hundred and one U.S. firms, the authors find different innovation characteristics predict different diffusion stages. The adaptation stage refers to initial use of an innovation, meaning use of EDI in the first application. The authors find high relative advantage, high technical compatibility, and lower costs led to better EDI adaptation in organizations. Internal diffusion refers to the extent of EDI integration into organizational activities. The authors find high relative advantage and long duration predict the extent of internal diffusion. External diffusion refers to the extent the firm is successful linking with external partners and converting external transaction documents into electronic form. The authors find higher technical compatibility and longer duration predict the extent a firm achieves external diffusion.

Cox and Ghoneim (1996) use a case study and a survey to study similarities and differences in various industries' EDI implementation process experiences. Their research investigates sector influence on EDI facilitators and inhibitors, EDI integration into different sector internal business processes, and whether EDI delivers its maximum benefit when integrated with internal business processes. Their research indicates EDI implementation drivers vary across industries. EDI critical success factors include senior management-supported EDI strategy, EDI strategy aimed at adding core business process and trading community value; continual, comprehensive EDI strategy review,

and core business process EDI integration. Since the authors were more concerned with EDI use than adoption, we include this research in the diffusion section.

Crook and Kumar (1998) use qualitative data collection and grounded theory data analysis to study EDI use in four organizations, each in different industries. Crook and Kumar's study addresses several EDI use aspects including causal conditions, types, encouragement strategies, consequences, and contextual factors. The authors find several EDI use facilitators. The study shows organizational context including: organizational size, information technology capability, and senior management commitment facilitate EDI use. The study shows several environmental context variables facilitate organizational EDI use. These include industry EDI experience, supplier nature, and customer-facilitated EDI use. The study also finds external pressure facilitates EDI use. External pressure includes customers forcing a firm's EDI use and firms feeling a need to use EDI to remain competitive. The authors find the desire to reap system benefits such as cost savings increases and customer service improvements facilitates EDI use. Support also facilitates EDI use. Support includes training, incentives encouraging use, and assistance selecting the technical infrastructure.

Ramamurthy et al. (1999) investigate interorganizational (customer support, customer expertise, and competitive pressure) and organizational (internal support, benefit potential, compatibility, and resource intensity) variables' effect on EDI diffusion. The authors define EDI diffusion as external and internal integration. Using a field survey of eighty-three firms in the motor carriers industry, the authors find compatibility positively and resource intensity negatively affect external integration. Expected/realized benefits impact internal EDI integration. Internal support influences internal and external integration. Interorganizational variables (customer support and competitive pressure) influence both internal and external integration.

### 3.3.2.3. Business-to-Business (B2B) Electronic Commerce (EC)

Using a survey, Han and Noh (1999-2000) investigate factors discouraging EC growth. First, the study finds unstable systems and low data security levels inhibit EC usage. Second, the study finds unstable systems, low data security levels, inconvenient

use, and unsatisfactory purchases affect EC satisfaction. Third, the study finds unsatisfactory purchases, social disturbance, and inconvenient use affect EC usefulness expectations.

Hope et al. (2001) use a literature review and case studies to determine critical success factors for B2B EC development. After reviewing the article, we categorize Hope et al.'s research with diffusion facilitators because the authors define B2B EC development in stages dealing with diffusing adopted technology rather than deciding to adopt technology. This decision was based on Hope et al.'s critical success factor categorization of adopting/updating internal software resources, developing interconnectedness, and achieving a virtual corporation.

In Hope et al.'s study, four critical success factors are predominant. These are: clear vision, customer readiness, top management support, and creative management thinking. The study identifies EC success factors not mentioned in the literature. These include: information sharing culture, clear and certain legislative and policy environment, and project start up timing. Hope et al. mention several other critical success factors including: marketing and system promotion, skilled staff in technical and business issues, current technology, and external expertise.

Ranganathan et al. (2001) use a literature review, interviews, and a survey to develop a list of forty-six B2B application deployment facilitators and inhibitors. The authors measure B2B application deployment as the extent the following goals are fulfilled: improved customer service, better inventory control, lower marketing and distribution costs, reduced cycle time, better supplier relationships, increased competitive advantage, and reduced operation costs. We categorize this study in the diffusion section because achieving these goals requires the system be used. The authors find the following factors facilitate B2B application deployment: top management support, organizational change, strategy-related project management, valuation, internal information technology environment, collaboration, external information technology environment, and external business environment.



Tabor (2001) investigates EC success facilitators using a case study of an early adopter airline. We discuss Tabor's research with the diffusion studies since she defines success as achieving stated goals, including transaction volume targets and transaction cost reduction. The study finds the following EC diffusion facilitators: customer-focused approach in design and process issues, easy to use technology, project leadership, consistent goals and strategy, culture supporting innovation, project adding transaction cost and/or customer search cost value, product equity/trust, innovative characteristics, management commitment, team composition, core competence, project management, and technology performance.

#### 3.3.2.4. Business-to-Business (B2B) Electronic Marketplaces (E-marketplaces)

Grewal et al.'s (2001) study is some of the first empirical work on B2B e-marketplaces. Using transaction cost theory, the motivation-ability framework, and institutional theory, the authors investigate firm electronic market participation. The investigation includes a survey of three hundred and six buyers, sellers, retailers, pawnbrokers, appraisers, and other intermediaries in Polygon. Polygon is an unbiased third party driven electronic marketplace for jewelry trading.

In their investigation, Grewal et al. classify firm participation into exploration, expert, and passive states. Exploration firm participation involves firms learning how to do business in the marketplace. Expert firm participation involves firms believing they have successfully reengineered their business processes to function effectively in the electronic market. In this state, firms have substantial knowledge about their electronic markets and procedural knowledge of doing business in the market. In the passive state, firms carry out virtually no business on the electronic market, but continue to maintain a market presence.

Grewal et al. find electronic market participation depends on organizational motivation and ability. Achieving the expert state requires firms to emphasize efficiency, emphasize information technology capabilities, and deemphasize legitimacy motives. The authors conceptualize legitimacy motivations as firms entering the e-marketplace to jump on the bandwagon, mimic others, and/or establish an image of

being technologically proficient. The authors conceptualize efficiency as firms entering the e-marketplace to: reduce the cost of running their business, streamline operations, and/or reduce the cost of transacting business with trading partners. The authors conceptualize information technology capabilities as having: strong information technology planning capabilities, strong technical support staff, an understanding of the potential benefits of information technology applications, and adequate information technology knowledge.

### 3.3.3. Adoption and Diffusion

The paragraphs below discuss two EDI studies investigating both adoption and diffusion facilitators.

Premkumar and Ramamurthy (1995) use a field survey to investigate how five interorganizational and four organizational factors affect EDI adoption decisions. The authors use power and social exchange theory as theoretical underpinning to investigate factors affecting an organization's EDI adoption approach (proactive vs. reactive). Examined interorganizational factors include net dependence, exercised power, transaction climate, and competitive pressure. Examined organizational factors include: top management support, champion existence, organizational compatibility, internal need and information system infrastructure. The study finds competitive pressure, exercised power, internal need, and top management support differentiate proactive and reactive firms. Reactive firms had high competitive pressure and exercised power scores, indicating outside pressure led to their EDI adoption. Proactive firms scored high on internal need and top management support. The study also finds proactive firms have greater adaptation, more external trading partner connectivity, and better EDI information integration with internal information system applications than reactive firms.

Hart and Saunders (1997) develop a theoretical framework addressing power and trust's influence on EDI adoption and use. They then use a case study to illustrate the framework's dimensions. Hart and Saunders' framework posits more powerful firms influence their trading partners to adopt EDI. Once EDI is adopted, trust between firms

determines expanded use. The authors explain in buyer-supplier relationships, power is a function of dependence on the other party and using this dependence to influence the other parties' actions. The authors incorporate Ring and Van de Ven's (1994) explanation of trust as confidence in the goodwill of others. The authors define trust as anticipated optimistic behavior of other parties.

The research posits and illustrates dependent firms are vulnerable to their more powerful trading partners' coercive tactics. However, better results and true interorganizational integration occur when EDI adoption is considered an opportunity to reinforce firms' relationships rather than a requirement imposed by more powerful firms.

### 3. 4. THEORY

Table 3 indicates a number of theories underpin IOIS research.

**Innovation diffusion theory** is the most common. Rogers' (1995) innovation diffusion theory identifies innovation attributes influencing adoption. Innovation diffusion theory posits a user's technology adoption decision is a rational choice based on technology characteristics. The theory posits decision makers adopt technology they perceive has greater relative advantage, compatibility, trialability, and observability, and less complexity.

**Power theories** underpin several IOIS adoption and diffusion studies. Several notions on power exist. Emerson (1962) did some of the first power work with social exchange theory. Social exchange theory notes "actor X's dependence on actor Y is (a) directly proportional to X's motivational investment in Y mediated goals, and (b) inversely proportional to those goals' availability to X outside the Y-X relationship" (Emerson 1962, p. 32). Thompson (1967) has a similar observation on power, noting an organization is dependent on some element of its task environment (a) in proportion to the organization's need for resources or performances that element provides, and (b) in inverse proportion to other elements' ability to provide the same resource or performance" (1967, p. 31). **Resource dependency theory** (Pfeffer 1988, Pfeffer and Salancik 1978) posits that an organization's environment is unstable and that

organizations try to reduce vulnerabilities and increase power relative to their constituents in order to survive. The degree an organization is dependent upon external resources is determined by the resource's importance, the organization's discretion over it, and whether alternatives exist. In applying this theory to technology adoption, resource dependency theory explains interorganizational relationships may not be based on efficiency. Rather, they may be formed to reduce environmental uncertainty and may be the result of power and influence over dependent organizations.

A few IOIS studies mention institutional and organizational structure theories. **Institutional theory** (DiMaggio and Powell 1983, Meyer and Rowan 1977) looks at organizational survival efforts focused on satisfying external stakeholders. Institutional theory suggests organizations adopt rules and practices that may not necessarily increase technical efficiency, but increase legitimacy in external stakeholders' eyes. **Organizational behavior theory** (Thompson 1967) suggests organizational variables such as size influence technical innovations adoption. IOIS research shows a large firm size facilitates customer-based IOIS adoption (Grover 1993), EDI adoption (Premkumar et al. 1997), and EDI use (Crook and Kumar 1998).

Economic-based theories underpin some B2B e-marketplace adoption and diffusion studies. As a whole, these theories underpin studies of organizational decisions to participate in B2B e-marketplaces. **Transaction cost economics** (Williamson 1979, Williamson 1982, Williamson 1985, Williamson 1994, Williamson and Ouchi 1981) posits an organization's goal is minimizing the cost of exchanging resources in the environment and the cost of managing exchanges inside the organization. Based on transaction cost economics, the **electronic markets hypothesis** (Malone et al. 1987) predicts electronic markets as the favored mechanism for coordinating material and information flows among organization in the presence of electronic communication technologies. The **move to the middle hypothesis** (Clemons et al. 1993) agrees with the electronic markets hypothesis idea that information technology will lead to increased outsourcing. But, it also hypothesizes that buyers will move toward long-term relationships with a smaller set of suppliers in order to (1)

leverage economies of scale due to investments in IT required to coordinate business relationships, and (2) provide supplier incentives. Along this same line, **incomplete contracts theory** (Hart and Moore 1990) argues certain things (e.g., supplier innovativeness) are observed by parties in a relationship, but are not verifiable by third parties (e.g., courts or arbitrators). These things cannot be contracted ahead of time, but must be bargained for later. Incomplete contracts theory posits suppliers are more likely to invest in noncontractible aspects of relationships if buyers commit to a small supply base.

Many IOIS studies, particularly B2B e-marketplace studies, cite the importance of achieving critical mass. **Critical mass theory** (Fulk et al. 1996, Granovetter 1978, Granovetter 1985, Markus 1990, Monge et al. 1998) posits some innovations require collaboration among potential adopters for any adopter to benefit. It further posits that if a network cannot obtain an installed base equal to the largest equilibrium network size, it will have to exit from the market if it cannot surpass the critical mass and become self-sustaining. Critical mass theorists believe decisions to participate in collective actions are based on perceptions of what the group is doing. Who participates, how many participate, and contributions to date influence participation decisions.

### 3.5. ANALYSIS

Table 4 takes twenty-seven IOIS studies in Table 3 and categorizes variables significantly influencing adoption and diffusion of various IOIS forms. We adopt Chwelos et al.'s category definitions. Interorganizational level research focuses on how environments and/or other firms' actions influence IOIS adoption and diffusion. Organizational level research focuses on internal attributes influencing IOIS adoption and diffusion. Technological level research focuses on perceived innovation characteristics influencing IOIS adoption and diffusion.

**Table 4 Categorization and Frequency of Significant Independent Variables by Study Type and Technology Type**

Independent Variable	Category	No. of Studies Focusing on		No. of Studies Focusing on			
		Adoption	Diffusion	COSS	EDI	B2B EC	B2B E-marketplace
Collaboration	Interorganizational		2		1	1	
Environment (includes uncertainty) (- relationship in 1 study)	Interorganizational	2	3	1	1	2	1
External expertise utilization	Interorganizational	1	1		1	1	
External pressure (- relationship in 1 study)	Interorganizational	8	4	1	10		1
Implementation support	Interorganizational	2	3		4	1	
Information intensity (value chain)	Interorganizational		1	1			
Nature of suppliers and customers	Interorganizational		1		1		
Timing of project start up	Interorganizational		1			1	
Trade organization support	Interorganizational		1		1		
Trust	Interorganizational		2		1	1	
User involvement	Interorganizational	2	1	2		1	
Valuation	Interorganizational		1			1	
Interorganizational Total		15	21	5	20	9	2
Environment favoring cooperation (includes information sharing)	Interorganizational		2		1	1	
	Organizational						
Need (perceived)	Interorganizational	2		1	1		
	Organizational						
Readiness	Interorganizational	1	1		1	1	
	Organizational						
Technology awareness	Interorganizational	1	2	1	1	1	
	Organizational						

**Table 4 Continued**

Independent Variable	Category	No. of Studies Focusing on		No. of Studies Focusing on			
		Adoption	Diffusion	COSS	EDI	B2B EC	B2B E-marketplace
Interorganizational/Organizational Total		4	5	2	4	3	0
Adoption decision (proactive)	Organizational		1		1		
Champion existence	Organizational	3		3			
Culture supporting innovation	Organizational		2		1	1	
Duration of project (longer)	Organizational		1		1		
Evaluation procedures	Organizational		1		1		
Firm size (large)	Organizational	1	1		2		
Goals, strategy, and vision (consistent and clear)	Organizational		4		1	3	
Information intensity (product)	Organizational		1	1			
Information systems function (proactive)	Organizational	1		1			
Information systems staff skill	Organizational		1			1	
Innovativeness	Organizational		1			1	
Integration into core business activities	Organizational	1	2	1	1	1	
Leadership	Organizational		1			1	
Management of project	Organizational		2			2	
Managerial thinking (creative)	Organizational		1			1	
Marketing and promotion	Organizational	3	1	3		1	
Organizational change (-relationship in 1 study)	Organizational	1	1			1	1
Participatory decision making	Organizational	1		1			
Planning and approval processes (-relationship in 1 study)	Organizational	2		2			

**Table 4 Continued**

Independent Variable	Category	No. of Studies Focusing on		No. of Studies Focusing on			
		Adoption	Diffusion	COSS	EDI	B2B EC	B2B E-marketplace
Resource intensity (- relationship)	Organizational		1		1		
Risk (- relationship for 1 study)	Organizational	4		1	2		1
Risk taking propensity of top management	Organizational	1		1			
Team composition	Organizational		1			1	
Top management support	Organizational	4	6	2	5	3	
Organizational Total		22	29	16	16	17	2
Data security	Technological		1			1	
Observability	Technological	1			1		
Relative advantage (includes perceived)	Technological	7	8	1	9	2	3
Technology (adaptability)	Technological						
Technology (compatibility)	Technological	1	2	1	2		
Technology (complexity) (less)	Technological	2		2			
Technology (convenience)	Technological		1			1	
Technology (cost)	Technological	1	1		2		
Technology (current, infrastructure)	Technological	2	5	2	2	3	
Technology (ease of use)	Technological		1			1	
Technology (satisfaction)	Technological		1			1	
Technology (social disturbance)	Technological		1			1	
Technology (stability)	Technological		1			1	
Technology performance	Technological		1			1	
Technological Total		14	23	6	16	12	3
	Grand Total	55	78	29	56	41	7



The categorization supports Chwelos et al.'s hypothesis and finds IOIS adoption and diffusion research also addresses technological, organizational, and interorganizational levels. The categorization expands Chwelos et al.'s hypothesis based in EDI adoption studies to adoption and diffusion studies for customer-oriented strategic systems, EDI, B2B EC, and B2B e-marketplaces.

Chwelos et al.'s (2001) hypothesis did not recognize that the same variable might have multiple categorizations. In categorizing independent variables reported in the IOIS literature, four variables (perceived need, environment favoring cooperation, readiness, and technology awareness) belong to both organizational and interorganizational categories. Perceived need in IOIS relates to an organization's perception of their business partners' needs. Perceived need falls into the interorganizational category. In recognizing customers' needs, these needs become organizational needs. As such, perceived need belongs to both organizational and interorganizational categories. In IOIS, both the organization's environment and the organization's relationship with other organizations involved in implementing the IOIS must be cooperative; therefore, environment favoring cooperation falls into both organizational and interorganizational categories. Readiness as a facilitator of adoption and diffusion also falls into organizational and interorganizational categories. Since IOIS span organizational boundaries, both the organization and its partners must be ready to adopt the IOIS. Technology awareness also falls into organizational and interorganizational categories. Both the organization and its business partners must be aware of new technology for it to be adopted and diffused.

Several authors (Grover 1993, Premkumar et al. 1997) use environmental for what Chwelos et al. call interorganizational. Grover's environmental variables include four industry variables (maturity, competition, information intensity, and adaptable innovations) and two customer variables (power and vertical coordination). Premkumar et al.'s environmental category includes climate, net-dependence, competitive pressure, and customer support. Breaking Chwelos' interorganizational category into an

environmental category and an interorganizational category will benefit future IOIS research. The interorganizational category would include how business partner relationships influence technology adoption and diffusion. The environmental category would focus on how other surroundings influence technology adoption and diffusion.

This analysis of variables significantly influencing IOIS adoption and/or diffusion provides a starting point for studies researching emerging IOIS. Table 4 shows independent variables significantly influencing technology adoption and technology diffusion. Table 4 also shows frequency of significant independent variable for COSS, EDI, B2B EC, and B2B e-marketplaces. For example, user involvement significantly influences IOIS adoption in two studies and IOIS diffusion in one study. Of the studies finding user involvement significant, two focus on COSS and one focuses on B2B EC.

### **3. 6. CONCLUSION**

In their 2002 MIS Quarterly article, Webster and Watson (2002, p. 13) state, “the progress of information systems as a field is impeded because there are few published review articles.” This chapter contributes to the field by bringing together IOIS research and providing a starting point for work on emerging IOIS. This chapter summarizes significant independent variables, dependent variables, study focus, research methods, and theoretical approaches of twenty-seven IOIS studies. See Table 3. We further analyze significant independent variables found in IOIS research. See Table 4.

Chwelos et al.’s (2001) EDI research synthesis and EDI adoption model provides the hypothesis framing the research. The authors hypothesize organizational, technological, and interorganizational level constructs facilitate IOIS adoption. In this chapter, we evaluate Chwelos et al.’s hypothesis by reviewing independent variables significantly influencing IOIS adoption and diffusion in twenty-eight empirical IOIS studies. This chapter supports and extends their hypothesis by applying it to both adoption and diffusion for an array of IOIS.

In the review, significant independent variables did fall into Chwelos et al.’s categories; however, a few variables fell into multiple categories (organizational and

interorganizational). As such, we extend Chwelos et al.'s hypothesis and propose variables found to significantly influence IOIS adoption and diffusion also facilitate emerging IOIS adoption and diffusion.

Table 4 shows more occurrences of independent variables influencing diffusion than adoption. Fifty-five independent variable occurrences facilitate adoption and seventy-eight independent variable occurrences influence diffusion. Most variables with significant IOIS adoption and diffusion relationships are in the organizational category. The technological and interorganizational categories have nearly equal significant independent variable occurrences. External pressure, top management support, and relative advantage have frequently been proven to significantly influence IOIS adoption and diffusion.

Table 2 indicates fifty-eight percent of the reviewed work focuses on EDI. EDI has been widely adopted and in existence longer than B2B EC and B2B e-marketplaces. Table 2 indicates only two B2B e-marketplace adoption and diffusion investigations. The field will benefit from investigations in this area.

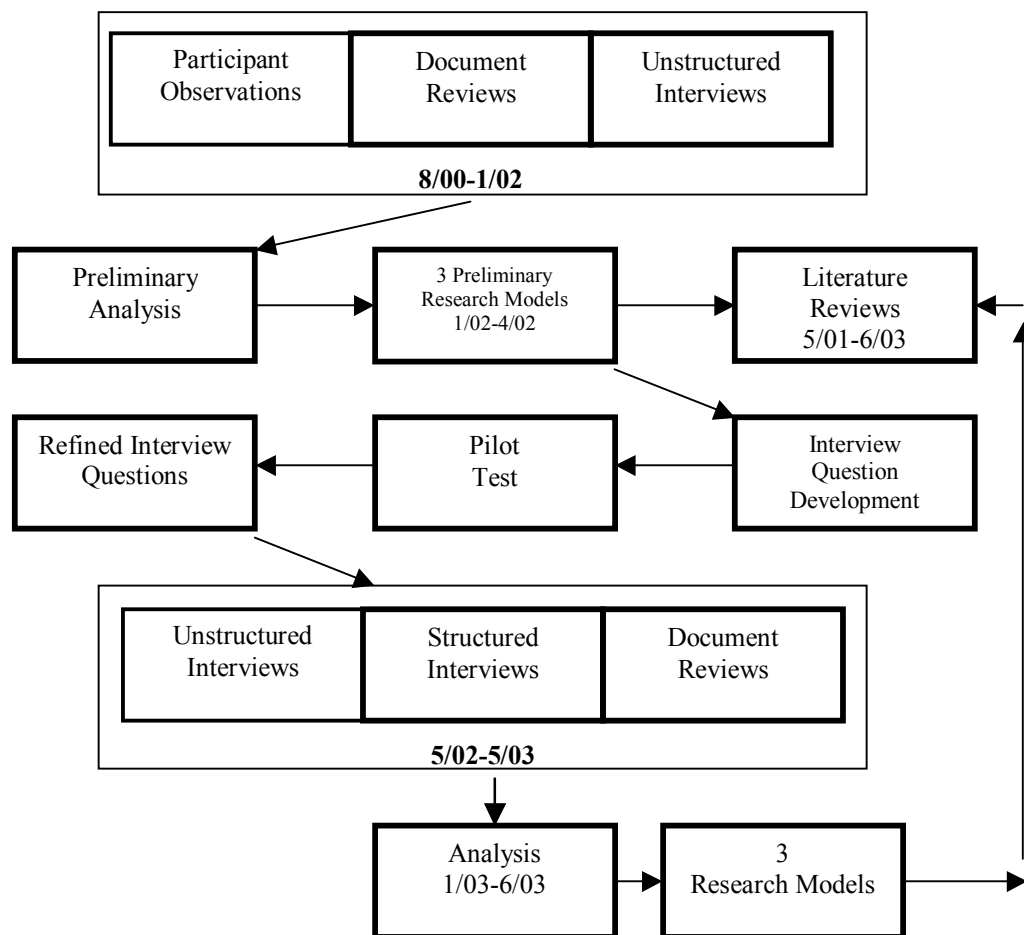
## CHAPTER IV

### RESEARCH METHODS, DESIGN, ANALYSIS, AND EVALUATION

#### 4. 1. RESEARCH METHOD

Figure 4 illustrates our research methods, which include: participant observations, document reviews, literature reviews, unstructured interviews, and structured interviews.

**Figure 4 Research Methods**



This research began in August 2000. At this time there was significant electronic commerce (EC) buzz, particularly business-to-business (B2B) and electronic marketplaces (e-marketplaces). Wall Street was rewarding organizations with EC initiatives and corporate America was announcing record numbers of B2B EC endeavors. However, other than B2B EC endeavor announcements, very little was written about B2B EC, particularly B2B e-marketplaces. Given this, a **grounded theory** (Charmaz 1983, Glaser and Strauss 1967, Strauss and Corbin 1997, Strauss and Corbin 1998) approach was most appropriate. The other research methods were not appropriate. An experiment would divorce the research questions from their context and only allow investigating a few relationships. A survey would have resulted in information on preconceived variables. It would not have allowed new drivers to emerge, and would not have provide explanations regarding why drivers were important and in what context they were important.

Glaser and Strauss pioneered grounded theory in their book, *The Discovery of Grounded Theory* (1967). The book was written at a time when the academic community viewed qualitative research as only a helpful preliminary to the “real” research methods of quantitative research. Glaser and Strauss’ book explains how to use qualitative data in developing theoretical analysis. The grounded theory method emphasizes discovery and theory development over logical deductive reasoning from prior theoretical frameworks. In grounded theory, data collection and analysis proceed simultaneously. Data shape the research process and products rather than theoretical frameworks. The grounded theory perspective holds that “using someone else’s theoretical framework adds little innovation and may perpetuate ideas that otherwise could be further refined, discarded, or transcended” (Charmaz 1983, p. 110). As advocated by grounded theory, we entered the field with open minds and learned about B2B e-marketplace issues as they arose, rather than trying to fit preconceived frameworks to a B2B e-marketplace context.

This initial phase of the research spanned eighteen months, from August 2000 through January 2002. This phase included **participant observations, unstructured**

**interviews, and document reviews** of B2B e-marketplaces in the convenience store industry, utility industry, lubricants industry, and oil and gas industry. Conducting this research involved negotiating access and writing field notes. Given today's business environment, it was not appropriate to tape record interviews. While in the field we took notes. Because we needed to stay engaged with our informants, we wrote key words down and filled in gaps upon leaving the field. When we left the field, we immediately typed our field notes using thick description (Emerson et al. 1995). Thick description involves collecting field notes that capture information about the research question, other information that emerges during the field visit that may not seem relevant to the study, and slices of the lives of our participants. A ninety-minute interview usually took two eight-hour days to type.

This initial phase included:

- six ninety-minute visits with a B2B e-marketplace for the convenience store industry;
- eight six-hour visits with one of twenty-one United States utilities involved in a B2B e-marketplace for the utility industry;
- one two-hour visit with an organization in the lubricants business participating in several B2B e-marketplaces; and
- one ninety-minute interview with a representative from a B2B e-marketplace in the oil and gas industry.

These initial field observations indicated that B2B e-marketplaces are struggling to attract members and then to influence these members to use the marketplace. The predominance of these struggles in our initial field note coding led to more focused research questions.

- Research Question 1: What drives B2B e-marketplace membership?
- Research Question 2: What marketplace characteristics drive B2B e-marketplace use?

- Research Question 3: What organizational characteristics impact an organization's B2B e-marketplace use?

Based on initial coding of our field notes, we developed three **preliminary research models**. See Chapter V. Each preliminary research model is a picture of the research question and the factors that seem to impact it. For example, preliminary research model two posits compatibility, uniform standards, and trust as B2B e-marketplace characteristics driving marketplace use.

Upon identifying the three research questions and preliminary research models, we searched for existing **literature** supporting the models. Most of the literature review occurred between May 2001 and April 2002; however, we stay abreast of recent research. The literature has not addressed the research questions and offers little empirical support for the preliminary models in the context of B2B e-marketplaces. As such, we expanded the literature review to include interorganizational information systems (IOIS) and the B2B e-marketplace trade press. Within this context, we found some support for the models' questions and drivers.

Given the limited academic research in this area, interviews were the most appropriate way to investigate the research questions. As previously discussed, the models and questions are based on our experiences with four field sites. Structured interviews allow us to understand if the models' proposed drivers are in fact drivers. Accompanying structured interviews with unstructured interviews allows soliciting proposed driver explanations and allows new drivers to surface accompanied by explanations of why these drivers are important. When new drivers surface, we probe for these drivers in the remaining interviews.

Before reentering the field to conduct the **structured and unstructured interviews**, we developed interview guides for:

- B2B e-marketplace representatives,
- member organizations (e.g., buyers and sellers), and
- organizations that chose not to join the e-marketplace.

The field experience, three research models, and Reich and Benbasat's interview protocol (1990) form the guides' basis. Six Texas A&M professors from an array of disciplines reviewed the guides. In May 2002, we pilot tested our guides. This involved conducting interviews with a B2B e-marketplace Buyer Development Manager and two procurement people from a B2B e-marketplace member organization. Based on feedback from these pilot tests, we revised the interview guides. The interview guides are in Appendix A.

The structured and unstructured interviews occurred between May 2002 and May 2003. Interview data collection is likely to suffer problems, including interviewee recall and truth shading. We use several methods explained in Reich and Benbasat's (1990) article to increase interview reliability. First, we use second-hand information to appear informed about the project and its outcomes. This information increases the chances of spotting irregularities in interview data and questioning the interviewer. Second, we design the interview guides to solicit information in several ways. We begin interviews with open questions about the topic and then ask more specific questions assessing the drivers' relationships to the research question.

#### **4. 2. RESEARCH DESIGN**

The preliminary fieldwork and initial coding indicate different e-marketplace members have varying e-marketplace perspectives and experiences. To elaborate on this idea, we design the research so that for each case, we solicit information from the B2B e-marketplace, a high seller, a low seller, a high buyer, a low buyer, and a nonmember. See Figure 5.



**Figure 5 Research Design**

Eisenhardt's work (1989) guided the number of cases in the study. Eisenhardt suggests using between four and ten cases to conduct case study research. This allows enough cases for the work to be convincing, but limits the volume so that a thorough analysis is possible. Given the depth of each case (e.g., the marketplace, buyers, sellers, and a nonmember), we chose four case studies. We chose a theoretical sample of B2B e-marketplaces and member organizations, selecting marketplaces and member organizations differing from one another.

Criteria for selecting B2B e-marketplaces for our study required the marketplace be envisioned as a telecommunication network linking multiple buyers and sellers in order to share information and/or conduct business. We chose four B2B e-marketplaces, each with different existence periods, numbers of members, and transaction levels. At the beginning of the study, three of the four marketplaces had just formed. All four marketplaces had high expectations regarding their success. By the end of the study only two marketplaces were still in existence. The interviews included discussion about the entire life cycle of the two failed e-marketplaces.

Our field investigation required interviewing people within each marketplace who knew about attracting organizational membership and influencing member organizations to use the marketplace. Table 5 shows the B2B e-marketplace

representatives interviewed. Interviews ranged between ninety minutes and five and a half hours.

**Table 5 B2B E-marketplace Representative Interviews**

Marketplace Name	People Interviewed
National Trucking Exchange (NTX)	<ul style="list-style-type: none"> <li>▪ Sales Regional Director</li> </ul>
Pegasus	<ul style="list-style-type: none"> <li>▪ President and Chief Executive Officer</li> <li>▪ Sales Vice President</li> <li>▪ Buyer Development Manager</li> </ul>
C-Store Exchange (CSX)	<ul style="list-style-type: none"> <li>▪ President and Chief Operating Officer</li> <li>▪ One board member</li> </ul>
Retail Matrix	<ul style="list-style-type: none"> <li>▪ Strategic Alliances Senior Vice President</li> </ul>

For each marketplace, we planned to interview a high seller, a low seller, a high buyer, a low buyer, and a nonmember. Table 6 shows the marketplace member organizations in our study, including the classification type, name, and job titles of the people interviewed. The table shows sometimes we interviewed more member organizations and more people within a member organization than required by the design. In other cases, a participant organization type did not exist within the marketplace. Only three organizations joined CSX. No organizations joined Retail Matrix. In this situation, we interviewed organizations close to joining.

**Table 6 B2B E-marketplace Member Organization Interviews**

Marketplace Name	Member Organization Classification and Type	Member Organization Name	Interviewee Job Title
National Trucking Exchange (NTX)	High seller	R.E. Transport	▪ Bid Manager
	Low seller	Southwestern Trucking	▪ Manger Special Projects
	High buyer	Texas Plastics	▪ Distribution Manager
	Low buyer	Leading Edge Brands	▪ Sales Representative ▪ Controller
	Nonmember	Merit	▪ President
	Nonmember	McMurray Foodservice	▪ Vice President of Logistics
Pegasus	High seller	Office Plus	▪ Vice President Strategic Accounts ▪ Quality Manager ▪ President ▪ Division Customer Service Representative
	Low seller	Bearing Point Manufacturing	▪ Account Executive, E-commerce
	Low seller	Mining Manufacturing	▪ Manager Capital Projects
	High buyer	Synergy	▪ Purchasing Manager
	High buyer	Gulf Coast Energy (Regulated)	▪ Corporate Purchasing and E-Procurement Manager
	Low buyer	Lone Star Utilities	▪ Procurement Services Manager ▪ Senior Contract Representative
	Low buyer	Gulf Coast Energy (Unregulated)	▪ Purchasing Manager
	Low buyer	U.S. Electric and Power	▪ Director, Strategic Procurement and Supply Chain
	Nonmember	U.S. Electric and Power	▪ Director, Strategic Procurement and Supply Chain
C-Store Exchange (CSX)	Low seller/buyer	McMurray Distributing	▪ Director of E-Business and International Systems ▪ Information Systems President ▪ Vice President of Marketing ▪ Vice President of New Market Development
	Low seller	Momentum Manufacturing	▪ Interview Pending
	Low buyer	Gulf Coast Oil	▪ Retail Sales Manager
	Nonmember	United States Convenience Store Association	▪ Senior Vice President of Strategic Alliances
	Nonmember	SuperSport Retail	▪ Coordinating Manager, E-Business and Emerging Technology

**Table 6 Continued**

Marketplace Name	Member Organization Classification and Type	Member Organization Name	Interviewee Job Title
Retail Matrix	Potential seller	Masterful Manufacturing	▪ Director of Sales
	Potential seller/buyer	Cosco Distributing	▪ Director of Tax
	Potential buyer	SuperSport Retail	▪ Coordinating Manager, E-Business and Emerging Technology
	Nonmember	McMurray Distributing	▪ Vice President of Marketing

Within each organization we interview the person that would know about the organization's participation in the B2B e-marketplace. Usually, when we speak with companies selling over the e-marketplace, we interview national sales managers. When we speak with companies buying over the e-marketplace, we interview procurement managers.

The interviews included high-ranking field experts. We interviewed a Chief Executive Officer named one of the top ten energy industry executives by *Energy Markets Magazine* and a Chief Operating Officer recognized as one of the top 100 information technology leaders by *Computerworld*. Because of the high demand on these experts' time, obtaining interviews was difficult. The e-marketplaces and member organizations were geographically dispersed throughout the United States.

While in the field, we asked questions, engaged in conversation, and wrote key terms down. We did not use a tape recorder because our prior field experiences indicate respondents do not want to be tape-recorded. Tape recording may also cause the respondents to be less forthcoming.

Upon leaving the field, we immediately typed the field notes. We used thick description (Emerson et al. 1995), writing everything we could remember. In order not to forget anything, we tried to write as much as possible before sleeping. In nine of the interviews, three researchers were present. In these cases, we all took, compared, and discussed the field notes.

#### **4. 3. RESEARCH ANALYSIS**

Data analysis occurred throughout the fieldwork. In the first quarter of 2002, we did an initial coding by reviewing collected field notes and seeing what was interesting.

This initial coding led to the three research questions and the three preliminary research models. See Chapter V.

We further investigated these questions and models using theoretical samples (Charmaz 1983, pp. 124-125) and interview guides. The theoretical samples' and interview guides' aim is facilitating cross-case analysis determining what distinguishes:

- e-marketplaces with high membership vs. e-marketplaces with low membership;
- e-marketplaces with high use levels vs. e-marketplaces with low use levels; and
- organizations with high use levels vs. organizations with low use levels, and nonmember organizations.

In the first half of 2003, after completing most of the field visits and collecting nearly five hundred single-spaced pages of field notes, analysis and coding became the primary focus. In coding the data, we analyzed each case (within-case analysis) and then compared each case (cross-case analysis) (Eisenhardt 1989). Within-case analysis involved creating case reports and case classifications. Case reports summarize field note responses relevant to the research questions. This is necessary because we prepared the field notes using thick description (Emerson et al. 1995). As such, we have much more information than is immediately relevant to the research questions and model. Case reports on each marketplace and each member organization include responses to the interview guide questions. For each e-marketplace this includes:

- number of members, transaction volume, and existence period;
- responses to categories influencing number of members and use level; and
- e-marketplace inception, business model, value proposition, and challenges.

Organization case reports include:

- each organization's marketplace use level;
- responses to categories influencing an organization's transaction volume; and
- how the organization joined and how they are using the e-marketplace.

To facilitate cross-case comparison, we classify each e-marketplace and each organization as follows:

- existing vs. closed e-marketplaces
- buyers vs. sellers
- members vs. nonmembers
- high users vs. low users
- high buyers vs. low buyers
- high sellers vs. low sellers

To determine what drives B2B e-marketplace membership and use, we review the coded data by category and respondent classification. Like Reich and Benbasat's (1990) *Information Systems Research* article, we rely on data inspection to determine if and how the various categories affect the research questions.

Because we collected over five hundred pages of single-spaced field notes, we use a software package to help organize the coding. QSR (Qualitative Solutions and Research) N6 (non-numerical data indexing, searching, and theorizing) is the sixth version of NUD\*IST software (QSR 2002a, QSR 2002b). In coding the data, we use node explorer to set up tree nodes with categories of interest. The initial categories are

based on the research design and the three research models. We read every interview. We code lines of text pertaining to our research question, research model categories, and research design into the appropriate category. The interview guides ask respondents if the initial research models' categories affect the number of members and/or use. We consider respondents' thoughts in the analysis. Because of the open data collection techniques, the field notes include categories not in the original model. When we find this, we create a new category and code related text into the category.

After coding for a while, at times finer grained category dimensions develop. For example, initially marketing and promotion was a category proposed to drive e-marketplace membership. After reviewing the field notes, we found different marketing and promotion dimensions. These include sales representatives with industry experience and sales calls involving e-marketplace training. We broke marketing and promotion into finer grained categories reflecting these dimensions. These marketing and promotion dimensions were present in the two existing marketplaces and were not present in the two shutdown marketplaces.

The analysis involves comparing responses from different types of respondents (e.g., currently existing vs. failed marketplaces; high users vs. low users; members vs. nonmembers). In making these comparisons, sometimes similar respondent types have similar responses and contrasting responses exist between respondent types. As these patterns develop, we write memos explaining the category and the category's effect on e-marketplace membership and/or use. An example is in the marketing and promotion category. The two e-marketplaces still in existence, with the most number of transactions and the greatest number of participants, paid considerably less attention to traditional marketing and promotion (e.g., trade shows, media tours, news releases) than the two failed e-marketplaces. In QSR N6, we create and write memos within each category. These memos form the beginning of the written work.

After coding the data, we revisit what we've coded in each category to further uncover category dimensions and the category's effect on the research questions. QSR N6 helps with this process. We can choose a category and hit browse and the

program will show everything coded by interview and line. The program has a “jump to original text” feature enabling viewing coded data in its original context. The program also allows sorting category data by respondent type (e.g., existing marketplaces vs. shut-down marketplaces; high users vs. low users). We write discoveries in this phase into memos, which form the basis of the final work.

This process results in three research models. Each model presents a number of factors that answer each research question. Each model is a substantive theory. Substantive theories explain phenomenon in particular settings.

Upon bringing these discoveries into the final work, we compare the work to the existing literature. We first compare what we’ve found to the existing B2B e-marketplace literature and the IOIS adoption and diffusion literature. We also compare the findings to relevant organizational theories, including innovation diffusion theory, institutional theory, power theory, resource dependency theory, transaction cost economics, and the theory of collective action in alliance-based interorganizational communication and information systems. In some cases, our work supported the existing literature. In these cases, our research brings together underlying similarities in phenomena normally not associated with one another. This increases the literature’s internal validity, generalizability, and conceptual level. In other cases, our work conflicts with the existing literature. In these cases, our findings indicate the limitations of the existing literature. Conflicting findings allow further exploration of the conflict and offer deeper insights into the emergent theory and the conflicting literature.

A common concern about qualitative research is that it provides little basis for scientific generalization. A common concern is generalizing from a single case. This is also a concern in experiments. This research does not involve statistical generalizations from a random sample. Case study work involves analytical generalizations. This research generalizes to theoretical propositions, not to populations or universes (1994). Each theory in Chapter VII, VIII, and IX ties to broader theoretical issues.

Scientific facts are based on many experiments that replicate the same phenomenon under different conditions. The same is true for case study research. For



these research models to have the overall generalizability of formal theories like transaction cost economics or institutional theory, the research models must be evaluated in other situational contexts to see if they hold. Relevant settings may include case studies of the development of other types of industry public goods such as industry supply chain initiatives and industry communication and information technology initiatives.

#### **4. 4. METHOD EVALUATION**

Credibility, transferability, dependability, and confirmability are the four criteria used to judge the soundness of qualitative research. These criteria are the qualitative counterparts to positivist evaluation criteria of internal validity, external validity, reliability, and objectivity (Denzin and Lincoln 2001, p. 21).

The paragraphs below discuss how this research addresses each of these criteria.

“Credibility involves establishing that the results of qualitative research are credible or believable from the perspective of the participants in the research” (Trochim 2001. p. 162). We addressed credibility by sharing the results of this research with one of our participants as the research unfolded. Our relationship with this participant began nearly three years ago and continues. We will further address the credibility issue by sharing our findings with all of our study participants in the form of a white paper. We plan to then contact each participant to discuss the findings’ credibility. We are also scheduled to present this research to the National Purchasing Institute. Feedback from sharing these results with a large group of purchasing managers will help us assess the credibility and believability of these results.

Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings (Trochim 2001. p. 162). Given that the research design included different types of marketplaces with different membership levels, use levels, and existence periods, our findings apply to B2B e-marketplaces. Within each marketplace, the research included buyers and sellers with high and low use levels. The research also included an organization that chose not to

join the marketplace. Given the array of organizations, the research findings apply to other organizations participating in B2B e-marketplaces.

We also compared the research findings to the existing literature. In many cases, theories and research developed in other settings agreed with this study's research findings. These situations increase our findings' transferability.

In addition, the research findings may apply to other settings. However, the transferability of these results to other settings is the responsibility of the one doing the generalizing (Trochim 2001, p. 162).

The quantitative view of reliability is based on the assumption of repeatability. Repeatability is concerned with whether you would obtain the same results if you could observe the same thing twice. Qualitative researchers reject the idea of repeatability by arguing that if you are measuring twice, you are measuring two different things. The qualitative notion of dependability emphasizes that the researcher account for the ever-changing context within which research occurs. With dependability, the researcher is responsible for describing the changes that occur in the setting and how these changes affect the way the researcher approached the study (Trochim 2001, p. 163).

In the course of the study several changes occurred. CSX, the marketplace that began this research, folded. Since we did not have a successful marketplace with high membership and high use, we had to add National Trucking Exchange as one of the four marketplaces in the study. The original research design required we interview four participant organizations within each marketplace. Retail Matrix was critical to the study because they provided an example of a marketplace that was never functional and had a short existence period. However, no buyers or sellers joined Retail Matrix. As such, we had to modify the research design to include organizations that were close to joining. The two marketplaces still in existence, with high membership and high use, changed their value propositions to support electronic procurement of existing contracts. This is contrary to the original definition of an open e-marketplace where anyone can buy from anyone else. We collected information on this change because it reflected what was occurring in reality. We incorporated these insights into our research findings.

In addition, as Appendix A shows, we were originally investigating what drives critical mass. We defined critical mass as a marketplace having enough buyer and seller member organizations to sustain. As we began conducting the field studies, we found our informants could not define what critical mass was for their marketplace or how they would know when they achieved it. As such, we changed our first research question to, “What drives marketplace membership?” We suggest using the findings of what drives marketplace research as a starting point in an investigation of B2B e-marketplace critical mass drivers.

Confirmability refers to the degree to which the results could be confirmed or corroborated by others (Trochim 2001, p. 163). This execution of this research includes several steps enhancing confirmability. In executing this research, the primary researcher conducted field visits, and entered and analyzed the field notes. In preparing the study’s findings, the primary researcher searched the existing data for negative instances contradicting the findings. The primary researcher also searched previous research for negative instances contradicting the findings and positive instances supporting the findings. In addition, secondary researchers challenged the primary researcher’s results. The secondary researchers suggested other ways of explaining and depicting the findings. In defending these results, the primary researcher would go back to the data and evaluate the alternative explanations.

#### **4. 5. CONCLUSION**

The chapter explains how we conducted our research. This research began in August of 2000. This was the early stage of the EC boom. While the industry press releases indicated industry’s involvement with EC, academics knew little about the phenomenon. As such, a grounded theory approach was the best way to determine and investigate the relevant e-marketplace issues.

The investigation included several stages. First, we interviewed executives, observed meetings, and reviewed documents to understand B2B e-marketplaces. After initially coding the field notes, we determined several pressing challenges facing

e-marketplaces. To further investigate these challenges we developed research questions, research models, interview guides, and a research design. We then reentered the field interviewing executives from four B2B e-marketplaces, four organizations participating in each e-marketplace, and one organization choosing not to participate in each e-marketplace.

Our investigation involves nearly fifty interviews with B2B e-marketplaces, member organizations, and organizations choosing not to join the e-marketplace. While many member organizations are multinational, the field visits were in the United States.

Chapter VI describes the four B2B e-marketplaces in our study.

## **CHAPTER V**

### **PRELIMINARY RESEARCH MODELS**

This chapter outlines three research models guiding our investigation of this study's three research questions.

- Research Question 1: What drives business-to-business (B2B) electronic marketplace (e-marketplace) membership? This question defines membership as organizations joining a marketplace.
  
- Research Question 2: What marketplace characteristics drive B2B e-marketplace use? This question defines use as transaction frequency and transaction volume. It measures use by frequency and volume of transactions executed via the marketplaces.
  
- Research Question 3: What organizational characteristics impact an organization's B2B e-marketplace use? This question defines use as transaction frequency and transaction volume. It measures use by an organization's transaction frequency, transaction volume, and self-categorization.

Each research model proposes a research question and several drivers impacting different case outcomes on the research question. Each model is based on findings from the initial eighteen months of fieldwork. Complete explanatory models would include an unmanageable number of variables. Therefore, the models' drivers are the ones that repeatedly surfaced in the initial field studies. After developing the models, we reviewed the literature to see if the drivers have been empirically proven in other B2B e-marketplace studies or other interorganizational information systems (IOIS) studies.

See Chapters II and III. If the variables have been proven in previous IOIS studies, we include them in discussing our model. Because of the limited empirical research in this area, the literature review also includes trade press articles.

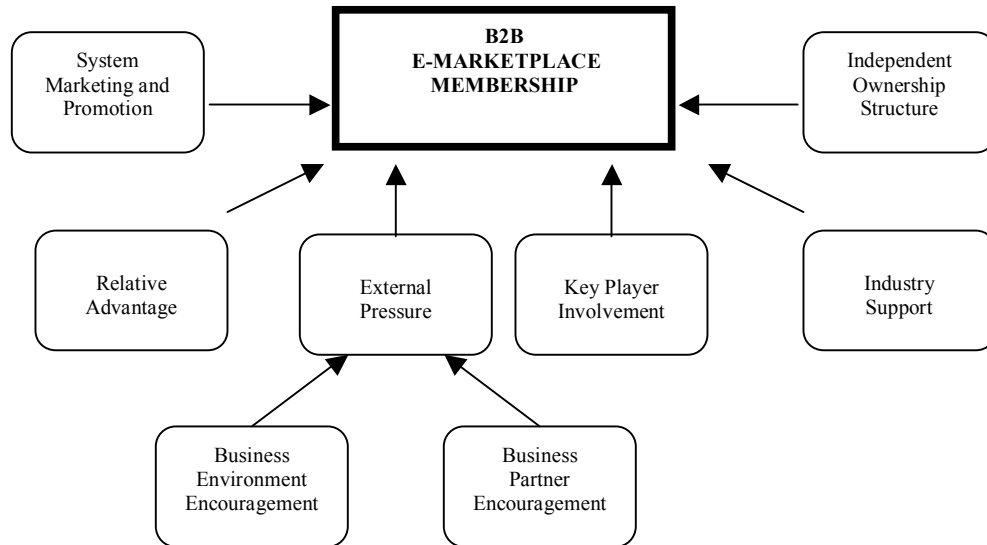
Cavaye and Cragg (1995) and Reich and Benbasat (1990) use the system as the unit of analysis. The preliminary research models, based on research questions 1 and 2 use the system as the unit of analysis. We define system as the marketplace. This encompasses the technical infrastructure by which marketplace transactions are conducted, but does not focus solely on this technical infrastructure. Research question 3 uses the organization as the unit of analysis.

Like Cavaye and Cragg's and Reich and Benbasat's work, the models take a process view (Markus and Robey 1988). Our models recognize that high marketplace membership does not guarantee high marketplace use. The model further recognizes that the presence of drivers posited in the model does not guarantee high achievement of membership or use.

### **5. 1. WHAT DRIVES B2B E-MARKETPLACE MEMBERSHIP?**

The first research question investigates what drives B2B e-marketplace membership. The initial field research indicates B2B e-marketplaces must achieve buyer and seller membership as a first step in achieving marketplace use. The initial field research further indicates attracting marketplace members is a stumbling block. The model, Figure 6, posits a number of marketplace membership drivers.

**Figure 6 Preliminary Research Model 1: B2B E-marketplace Membership Drivers**



Researchers have not investigated factors influencing marketplace membership. However, a number of IOIS studies identify the importance of achieving a critical mass of members. Lee and Clark's (1996a) electronic markets (e-markets) work explains without critical mass usage is unlikely to spread and may end. Several other IOIS studies (Cavaye and Cragg 1995, O'Callaghan et al. 1992, Premkumar et al. 1997, Reich and Benbasat 1990, Rogers 1995, Runge 1985, Runge 1988, Tumolo 2001) mention the importance of achieving a critical mass of members. Critical mass theory posits if a network cannot obtain an installed base equal to the largest equilibrium network size, it will have to exit from the market if it cannot surpass the critical mass and become self-sustaining.

The research measures marketplace membership by asking respondents how many organizations are currently part of the marketplace.

Preliminary research model 1 posits several B2B e-marketplace membership drivers. These include:

- system marketing and promotion
- relative advantage
- external pressure
  - business environment encouragement
  - business partner encouragement
- key player involvement
- industry support
- independent ownership structure.

The paragraphs below define each driver and cite IOIS studies empirically linking these drivers to IOIS adoption. IOIS adoption studies are cited because previous IOIS adoption did not require membership as e-marketplace adoption does. The paragraphs below cite drivers proven in an array of IOIS contexts (COSS, EDI, EC) as support for the model since a B2B e-marketplace is a type of IOIS and little B2B e-marketplace empirical work exists. Since some drivers can be measured in multiple ways, refer to the interview guide in the appendix for more detail on measures for each driver.

Many authors (Cavaye and Cragg 1995, Hope et al. 2001, Iacovou et al. 1995, Reich and Benbasat 1990, Runge 1985, Runge 1988) mention **system marketing and promotion** as an adoption facilitator. System marketing and promotion refers to making target organizations aware of the marketplace and aware that the marketplace would like these organizations to be a part of the marketplace.

Several customer-oriented strategic system studies (Cavaye and Cragg 1995, Reich and Benbasat 1990, Runge 1985, Runge 1988) link system marketing and system promotion to adoption. Reich and Benbasat propose customer education, customer support, marketing programs, and customer-oriented strategic system support facilitate adoption. Reich and Benbasat (1990) also find lack of sales force training affects



marketing efforts and discriminates between high and low adoption rates. Iacovou et al.'s (1995) electronic data interchange (EDI) case studies link promotional efforts to small business adoption. Hope et al.'s (2001) case studies and surveys in the transport and logistics industry find that system marketing and promotion facilitates B2B EC development. Hope et al. (2001) propose three B2B EC development stages: (1) adopting/updating internal resources, (2) developing interconnectedness, and (3) achieving a virtual corporation. Hope et al. did not specify in what stage marketing and system promotion is important.

The model posits perceived **relative advantage** drives marketplace membership. Rogers defines perceived relative advantage as "the degree an innovation is perceived as being better than the idea it supersedes" (Rogers 1995, p. 213). Given this definition, we also include studies citing perceived benefit as support for the model. In the model, we elaborate Roger's definition by defining relative advantage as the degree a B2B e-marketplace's value proposition fills a need within organizations or improves existing organizational operations.

Several studies link perceived relative advantage to system adoption (Chwelos et al. 2001, Iacovou et al. 1995, Lee and Clark 1996b, O'Callaghan et al. 1992) and use (Grewal et al. 2001, Premkumar et al. 1994).

Three studies link relative advantage variations to EDI adoption. O'Callaghan et al.'s (1992) EDI adoption decision investigation indicates a significant relationship between perceived relative advantage over present systems and EDI adoption decisions. Iacovou et al. (1995) find a relationship between perceived benefits and EDI adoption. Chwelos et al. (2001) find a significant relationship between perceived benefits and EDI adoption intention.

Two studies link relative advantage to EDI diffusion. Premkumar et al. (1994) link relative advantage to EDI adaptation and internal diffusion. Adaptation is the initial use of EDI and internal diffusion is the extent of EDI integration into organizational activities. Ramamurthy et al. (1999) link benefit potential to internal integration. They

define internal integration as “the extent EDI interfaces with other internal IS applications and work processes” (p. 257).

Studies link relative advantage variations to B2B e-marketplace adoption and use. Lee and Clark (1996b) link increased efficiency and effectiveness to B2B e-marketplace adoption. Grewal et al. (2001) link B2B e-marketplace adoption fueled by efficiency motivations to marketplace use.

Many authors (Cavaye and Cragg 1995, Chwelos et al. 2001, Crook and Kumar 1998, Damsgaard and Lyytinen 1998, Grewal et al. 2001, Iacovou et al. 1995, Premkumar and Ramamurthy 1995, Premkumar et al. 1997, Ramamurthy et al. 1999, Reich and Benbasat 1990) link **external pressure** to varying IOIS stages. The model defines external pressure as a business environment encouraging B2B e-marketplace membership and/or member organizations requesting trading partners participate in the marketplace. We operationalize the business environment encouraging marketplace involvement by noting the marketplace’s formation date. In the few years before the January 2001 “dot.com” crash, everyone was enamored with technology and Internet capabilities. As a result, the business environment encouraged organizations’ EC involvement. We further operationalize business environment encouragement by looking for comments like “we have to get into marketplaces because everyone else is” and “Wall Street favors organizations with e-business strategies.” We determine the presence of trading partner request as a B2B e-marketplace membership driver by looking for comments like “we joined the marketplace because our trading partner asked.”

Two studies (Cavaye and Cragg 1995, Reich and Benbasat 1990) in the COSS context link varying external pressure definitions to system development. These studies are relevant to our model because development decisions are similar to adoption decisions as they both recognize a system need. Reich and Benbasat (1990) show competitive pressure relates to COSS development. The authors find systems developed in environments where rivalry among competitors is very high, organizations are concerned rivals are developing systems, and a strong threat from new entrants exists.

Cavaye and Cragg (1995) find mixed results for competitive pressure as a system development facilitator. The authors define competitive pressure as the extent industry leaders are implementing the system and the implementing organization's realization they need to implement a similar system to remain competitive.

Several EDI studies (Chwelos et al. 2001, Crook and Kumar 1998, Damsgaard and Lyytinen 1998, Iacovou et al. 1995, Premkumar and Ramamurthy 1995, Premkumar et al. 1997) link varying external pressure definitions to EDI adoption. Iacovou et al.'s (1995) case studies find a significant relationship between external pressure and EDI adoption. In Iacovou et al.'s studies, external pressure refers to organizational environment influences, including competitive pressure and trading partner imposition. Competitive pressure refers to others in the industry implementing EDI. Trading partner imposition is a function of the trading partners' potential power and influence strategy.

Premkumar and Ramamurthy (1995) find competitive pressure and exercised power discriminate between firms with proactive and reactive EDI adoption approaches. They find firms with proactive EDI adoption approaches experience greater adaptation, more trading partner connectivity, and better EDI integration with internal information systems applications. We include this study as support for our model because it shows a link between external pressure components and adoption.

Premkumar et al. (1997) find competitive pressure discriminates EDI adopters from nonadopters. The authors define competitive pressure as "an environment in which there is a constant need for firms to evaluate advances in information technology to gain competitive advantage or because of strategic necessity" (p. 110).

Crook and Kumar's (1998) grounded theory EDI study shows coercion, in the form of large powerful organizations requiring trading partners use EDI, as a strategy for achieving EDI use. Even though Crook and Kumar's study links coercion to achieving trading partner use, we include it as support for our model because an organization has to adopt EDI before they can use it.

Damsgaard and Lyytinen (1998) find the "herd effect," defined as adopting EDI because everyone else is, influences EDI adoption.

Ramamurthy et al. (1999) find competitive pressure influences EDI diffusion. The authors define competitive pressure as entrenched competition threats. The authors define EDI diffusion as internal and external integration. Internal integration is the extent EDI interfaces with other internal information systems' applications and work processes. External integration is the extent of EDI use with trading partners in terms of scope of services and penetration in these transactions. We include this study as support for our model as organizations must adopt EDI for it to be diffused.

Chwelos et al. (2001) find external pressure facilitates EDI adoption intentions. The authors define external pressure as influences arising from the organization's competitive environment. Of these sources, competitive pressure and enacted trading partner power have significant relationships with external pressure. Chwelos et al. define competitive pressure as "EDI's ability to maintain or increase competitiveness within the industry" (p. 307). The authors define enacted trading partner power as "the strength of the influence strategy (e.g., rewards and threats) used to exercise potential power" (p. 309).

In the B2B e-marketplace context, Grewal et al. (2001) find organizations adopt B2B e-marketplaces for legitimacy motivations. They define legitimacy motivations as external environment encouragement.

Our model posits **key player involvement** drives B2B e-marketplace membership. A standard definition for key player is an organization having more sales than most other industry organizations or an organization with few competitors in either production or consumption of industry goods. Tumolo's (2001) B2B EC exchange article explains most exchanges have failed because key industry players were not equity members. In defining key players, we use our informants' definitions by asking who they think the key industry players are and how they define key.

The model posits **industry support** drives marketplace membership. We operationalize industry support by trade organization support of the marketplace.

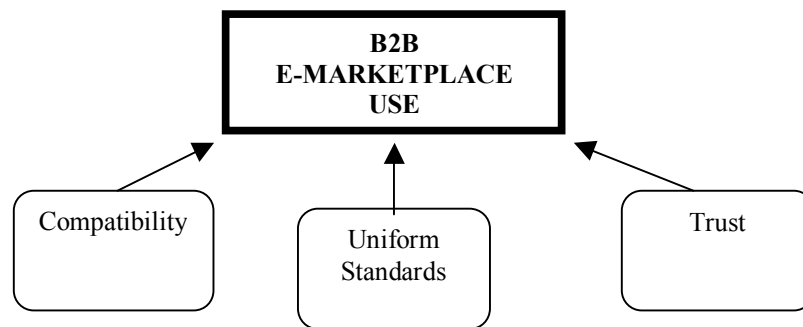
The model posits **independent ownership structure** drives B2B e-marketplace membership. We operationalize independent ownership structure as a separate

governance process and a management team not currently employed by industry organizations. Memishi (2001) proposes an exchange's success is contingent on the founding companies distancing themselves from the exchange as organizations will be hesitant to join competitor-operated exchanges.

## 5.2. WHAT MARKETPLACE CHARACTERISTICS DRIVE B2B E-MARKETPLACE USE?

The second research question considers B2B e-marketplace characteristics driving marketplace use. This question surfaced in the initial field studies. We found organizations signing up to participate in B2B e-marketplaces, but then not using the marketplace because of the marketplace's characteristics.

**Figure 7 Preliminary Research Model 2: Marketplace Characteristics Driving B2B E-marketplace Use**



System use as a dependent variable has a long history in information systems literature; for a review see Delone and McLean (1992). We define use as the frequency and volume of transactions executed over the B2B EC marketplace. We also measure use by the frequency and volume of transactions executed via the marketplaces. We use cross-case analysis to determine what factors discriminate between high volume and low volume marketplaces.

Preliminary research model 2, Figure 7, posits three marketplace characteristics drive marketplace use. These include: compatibility, uniform standards, and trust.

**Compatibility** is “the degree an innovation is perceived as being consistent with potential adopter’s existing values, past experiences, and needs” (Rogers 1995, p. 224). We operationalize compatibility as the degree a B2B e-marketplace integrates with existing industry operating procedures. Specifically, does the B2B e-marketplace technology integrate with existing systems? Do the business practices match existing business practices?

Several studies (Han and Noh 1999-2000, Premkumar et al. 1994, Ramamurthy et al. 1999, Tumolo 2001) link compatibility to system use. Premkumar et al. (1994) investigate compatibility’s role in varying EDI diffusion stages. They break compatibility into organizational and technical dimensions. Organizational compatibility considers work practices. Technical compatibility refers to internal and external information technology applications. Considerations include hardware platforms and network protocols. The authors find relationships between compatibility and adaptation, with adaptation defined as initial EDI use. The authors also find relationships between technical compatibility and external diffusion, with external diffusion the extent the firm successfully links with external partners and converts its external transaction documents into electronic form. Ramamurthy et al. (1999) link compatibility to external integration. The authors define external integration as the extent of EDI use with trading partners in terms of scope of services and penetration in these transactions.

Han and Noh (1999-2000) find systems that are inconvenient to use discourage EC growth. We include this study in the model because inconvenient use fits with the definition of compatibility. Tumolo’s (2001) thoughts further support technical compatibility as a marketplace use facilitator. Tumolo comments the ability to integrate a company’s back office system seamlessly with exchanges is a critical success factor.

We define **uniform standards** as having a standard way of describing products. Several authors (Krovi 2001, Lee and Clark 1996a, Memishi 2001) note that currently

each company and each industry has a unique way of describing products. Since B2B e-marketplaces are based on purchasing products without physical sight, uniform standards would make marketplace product purchases less risky.

The model posits **trust** drives marketplace use. Trust refers to a reliance that promises made by the marketplace will be kept. These promises include on time delivery, adequate product quality, and privacy. This definition of trust is derived from Hart and Saunders (1997), who explain trust is anticipated optimistic behavior of other parties, and Ring and Van de Ven (1994), who explain trust is confidence in the goodwill of others.

Hart and Saunders (1997) provide a theoretical framework and use a case study illustrating the importance of trust in whether and how EDI is used. The authors hypothesize firms using persuasive mechanisms to influence their trading partners to adopt EDI achieve higher trust and integration levels.

In the context of EC, Rosenbaum (2000) mentions trust's importance and the need for technical and social means to build and maintain relations. Using a case study and questionnaires, Tabor (2001) links trust to EC success in the context of an early-adopter airline. Given that Tabor defines success as use, we include this study as support for the model.

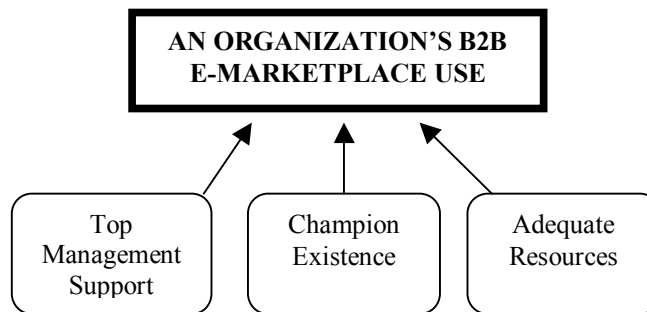
Several authors (Lee and Clark 1996a, Tumolo 2001) link trust with B2B e-marketplaces. Lee and Clark posit having a trusted third party for product evaluations as a critical success factor. Tumolo explains exchanges need to ensure participating suppliers are able to supply the quality and quantity of goods demanded and have the integrity to fulfill contracts.

### **5.3. WHAT ORGANIZATIONAL CHARACTERISTICS IMPACT AN ORGANIZATION'S B2B E-MARKETPLACE USE?**

The third research question addresses organizational characteristics impacting an organization's B2B e-marketplace use. This question evolved from the initial field

research, where we found seemingly similar organizations adopting the same B2B e-marketplace and achieving different use levels. Some organizations were heavy users and some hardly used the marketplace.

**Figure 8 Preliminary Research Model 3: Organizational Characteristics Impacting an Organization's B2B E-marketplace Use**



Research model 3, Figure 8, posits a number of factors impact an organization's e-marketplace use. We define use as transaction volume and transaction frequency. We measure use by an organization's marketplace transaction frequency, transaction volume, and self-categorization. We define a member organization as an organization that has agreed to buy products, sell products, and provide or gather information via the marketplace. Since this section focuses on a particular organization's marketplace use, we expand the literature review to include single organization systems, as well as IOIS. We use within-case analysis to determine organizational factors discriminating between high and low volume users within the same B2B e-marketplace.

Preliminary research model 3, Figure 8, posits three organizational characteristics impact an organization's B2B e-marketplace use. These include top management support, champion existence, and adequate resources.

**Top management support** refers to whether, in the period after deciding to participate in the B2B e-marketplace, a member organization's management favors the organization using the marketplace.



Several studies link top management support to system adoption. Reich and Benbasat's (1990) case study indicates a relationship between top management support and COSS development and adoption. Surveying executives, Grover (1993) finds top management support a strong COSS adoption facilitator.

Premkumar and Ramamurthy's (1995) EDI decision-making field survey links top management support to proactive system adoption and finds proactive system adoption leads to increased use. Premkumar et al.'s 1997 EDI field study links top management support to system adoption.

Several studies link top management support to varying aspects of diffusion. In a study of Materials Resource Planning implementation, White (1980) links top management support to successful implementation and use. Roberts and Barrar's (1992) Materials Resource Planning implementation case studies find a strong relationship between top management support and implementation. Ruppel and Howard's survey (1998) finds top management support a facilitator of telework adoption and diffusion.

Cox and Ghoneim's (1996) survey and case study finds top management support influences the degree of EDI integration into internal business processes. Ramamurthy et al.'s (1999) field surveys link internal support to EDI diffusion, defined as internal and external integration. The authors define internal support as senior management support and information technology function support. Using case studies and a brief survey, Hope et al. (2001) find top management support a strong B2B EC success facilitator. In Hope et al.'s mapping of factors to system stages, top management support is highly correlated with developing system interconnectedness. Tabor's (2001) EC success case study and survey finds management commitment strongly affects system use aspects.

The model posits **champion existence** drives an organization's B2B e-marketplace use. Champion existence refers to someone in the organization consistently pushing for the organization to use the B2B e-marketplace.

Using a case approach to study telecommunication-based system adoption, Runge's (1985, 1988) field notes mention champion existence a number of times.

However, he was unable to correlate champion existence with adoption. Reich and Benbasat's (1990) case study indicates a relationship between champion existence and COSS development and adoption. Using surveys, Grover (1993) finds champion existence a strong COSS adoption facilitator. Using case studies, Cavaye and Cragg (1995) find mixed support for champion existence facilitating designing and building customer-oriented interorganizational systems.

Ruppel and Howard's (1998) telework survey finds a significant relationship between champion existence and technology adoption and diffusion.

The model posits **adequate resources** impact an organization's B2B e-marketplace use. We define adequate resources as dedicating time and money to incorporate the marketplace into the organization's existing processes.

Using case study and ethnography, Kautz (1996) finds a relationship between resource allocation and an electronic mail system implementation. In small business EDI adoption case studies, Iacovou et al. (1995) find a relationship between financial and technological assistance and adoption. Financial and technological assistance refers to whether EDI initiators provide their trading partners these resources. Eze and Seong (2001) find a relationship between adequate resources and EC deployment for Singapore enterprises.

Some references link top management, champion existence, and adequate resources to system adoption. We agree there is a relationship between these facilitators and adoption, but the initial field data and several of the studies listed above link these facilitators to system use. As such, the model proposes a relationship between an organization's B2B e-marketplace use and top management support, champion existence, and adequate resources.

#### **5. 4. CONCLUSION**

This chapter discusses preliminary research models guiding the field research inquiries into three research questions.

- Research Question 1: What drives B2B e-marketplace membership?
- Research Question 2: What marketplace characteristics drive B2B e-marketplace use?
- Research Question 3: What organizational characteristics impact an organization's B2B e-marketplace use?

These models are based on eighteen months of unstructured interviews, participant observations, and document reviews. This phase spanned from August 2000 until January 2002. After developing the questions and models, we reviewed the literature to see if the research questions had been investigated and if so what were the outcomes. The review indicated limited B2B e-marketplace literature exists. Since an e-marketplace is a type of IOIS, we expanded the review to include IOIS literature. Because question three is at the organizational level, we also reviewed organizational level information system studies.

## **CHAPTER VI**

### **BUSINESS-TO-BUSINESS**

#### **ELECTRONIC MARKETPLACE DESCRIPTIONS**

A business-to-business (B2B) electronic marketplace (e-marketplace) is a network facilitated by telecommunications created to enable multiple buyers and sellers to exchange information and complete transactions (Zwass 1999) for goods and services in virtual locations. Each B2B e-marketplace has business models and value propositions. Business models address how marketplaces generate revenue and include (Robinson 2003): products and services offered, activities performed to deliver products and services, members, revenue collection strategies, technology, and strategic partners. Value propositions address what benefits marketplaces provide to members and stakeholders.

In the paragraphs below we discuss the four B2B e-marketplaces in the study, including their inception, business model, value proposition, and evaluation. Data from this discussion comes from the field visits and external document reviews, which occurred primarily between May and November 2002.

Table 7 shows evaluation criteria for each marketplace in the study. Existence period begins when the marketplace announces its existence and begins soliciting membership. In most cases, this occurs before the marketplace is incorporated and open for business. Operation period ends when the marketplace shuts down, as indicated by marketplace publications or court proceedings. Number of members identifies how many organizations are part of the marketplace. A corporate e-marketplace membership decision can encompass a corporation's many affiliates. For example, Gulf Coast Oil Corporation's decision to become a member of C-Store Exchange (CSX) added one member with 3,500 users to CSX's marketplace. For the first two cases, we measured use with transaction volume. The other two marketplaces never conducted transactions.

CSX measured use by the number of stores using the e-marketplace daily. Retail Matrix's marketplace was never functional. As such, the e-marketplace was never used.

**Table 7 B2B E-marketplace Evaluation**

	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)	RETAIL MATRIX
Existence Period	1995- present	June 2000- present	March 2000- October 31, 2002	April 2000-June 2002
No. of Members	Over 2,500	Over 400	4	3
Use	Over 10,000 transactions/day	Around 1,000 transactions/day	3,500 Gulf Coast Oil convenience stores use daily	0 transactions

Table 8 categorizes each B2B e-marketplace in the study based on each marketplace's intended business model and value proposition. Chapter II presented an array of B2B e-marketplace categorization schemes. Since no scheme has yet achieved dominance, we categorize the four marketplaces using each scheme. The table's author proposed scheme column notes the categorization scheme and the author proposing the scheme. The value range scheme column shows the different values within the author proposed scheme. The table shows that in some cases, a marketplace did not fit into any of the proposed schemes. In other cases, an e-marketplace fit into multiple schemes.

**Table 8 Marketplace Categorization**

AUTHOR PROPOSED SCHEME	VALUE RANGE	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)	RETAIL MATRIX
Industry Focus (Tumolo 2001)	Vertical or Horizontal	Horizontal	Vertical	Vertical	Vertical
Openness (Andrew et al. 2000)	Private or Public	Public	Public	Public	Public
Business Models (Kaplan and Sawhney 2000)	Maintenance, repair, and operation hub; Horizontal markets; Electronic catalog hubs; or Exchange hubs	Maintenance, repair, and operation hub; Yield manager	N/A	N/A	N/A
Pricing and supplier identification practices (Dai and Kauffman 2001)	Private aggregation, public aggregation, private negotiation, or public bidding	Public bidding	Price aggregation, private negotiation, public bidding	Price aggregation	N/A
Ownership structure (Memishi 2001)	Independently-owned or participant-owned	Independently-owned	Participants have 3 of 7 board seats	Participant- owned	Participant-owned

## **6.1. NATIONAL TRUCKING EXCHANGE (NTX)**

While working for a logistics company shipping McDonald's supplies, Gary Roag noticed as trucks delivered products along their routes, their remaining trailer capacity went unused. Solving this unused capacity problem led Gary Roag and a group of venture capitalists to form NTX in 1995.

NTX developed slick technology to help shippers and carriers make use of unused capacity. Marketing NTX involved presenting shippers and carriers the idea and technology. However, these presentations had little success in achieving shipper and carrier adoption. After going nowhere for five years, NTX changed marketing strategies, hiring sales representatives who were already working in the transportation industry. This group knew how the transportation industry worked at the street level and conveyed to technology designers industry operations and industry needs. Having industry contacts and presenting NTX in terms understandable to shippers and carriers, this group was effective at attracting potential shippers and carriers and influencing them to join and use NTX.

### **6.1.1. Value Proposition and Business Model**

NTX sells unused truck capacity. Diesel trucks (carriers) pick up products (loads) at one point and deliver them to another. The load may not fill the truck's entire trailer. After delivering the load, the truck could return to its origination empty. Both of these scenarios result in unused truck capacity. If the truck were full, there would be less waste and the carrier's profits would increase. NTX is a B2B e-marketplace addressing this problem.

NTX connects carriers and shippers using technology. NTX allows businesses with loads to ship by diesel transport to post their needs on NTX's website. These people are called shippers. NTX helps diesel transport carriers find these loads. In posting a load to ship, a shipper enters shipment information including pick up time, delivery time, weight, refrigeration needs, and amount the shipper is willing to pay for

the load's transport. The load posts to NTX's website immediately. Carriers view the website by geographic region. After evaluating load criteria, they can accept loads meeting their specifications. In most cases, carriers have a central dispatch that finds loads. When a carrier is sent to pick up a load, central dispatch views NTX's website to see loads available along the carrier's route. If the existing load does not fill the truck, central dispatch can find other loads on NTX to fill the truck. Central dispatch also looks for loads to fill the truck once it delivers its original load and needs to return to its origin. This is called a backhaul. Once the carrier or central dispatch finds the load, they click the NTX screen to accept. NTX immediately sends email notification of the load's acceptance to the shipper. The shipper then prepares the load for pick up.

Miles traveled drives shipping costs. When a shipper has to ship less than a truckload of freight, the shipping price must still cover the miles the truck and driver travel. Engaging an entire truck to move less than a truckload full of product is expensive. NTX is helpful in these situations. By bringing together shippers, NTX allows carriers to consolidate a number of loads into one truck. Having one full truck lowers shipper costs, spreading mileage and driver costs over a number of shipments. Carrier profits increase as once costs are covered additional loads on the truck are profit. One company in the study uses NTX to move all of their less than truckload freight. NTX offers them better shipping rates than they could achieve by negotiating shipping with carriers directly.

In transporting products, most companies have prenegotiated contracts with carriers routinely transporting their products. However, non-routine shipments, either occasional shipments or shipments falling outside their carrier's shipping areas, requires examining alternative shipping methods. This process involves calling shippers, giving load information, and requesting prices. Because of quote variations and carrier availability, this process is time-consuming and requires calling a number of carriers. NTX replaces calling multiple carriers, enabling shippers to post load criteria on a website for carriers to view and accept. In addition, by providing a mechanism to post bid loads and minimum prices, NTX lowers shipper transportation costs and increases



carrier profits. NTX lowers shipper transportation costs as shippers experiment with the system, posting the lowest price possible to move the freight. For carriers, with the same route as the shipper's load, a low price is better than an empty truck.

One company in the study developed an excel spreadsheet for all transactions completed over NTX. The spreadsheet listed by load their usual shipping costs, costs using NTX, and savings. The company's savings were substantial. However, their spreadsheet did not include labor savings from improving the request for price process.

Most carriers try and fill unused truck capacity by having a number of prenegotiated contracts in a region and using broker services like "dial-a-truck." In the "dial-a-truck" model, carriers call a number to see if there are shipments to fill their unused truck capacity in the area. These mechanisms are not as efficient, dynamic, or timely as NTX's internet-based model.

NTX's core value proposition offers several by-product value propositions, including simplifying accounting practices and improving reports. When a shipper uses NTX to ship products, the shipper gets one monthly invoice from NTX. Not using NTX and purchasing freight from a variety of carriers, involves processing billing statements for each load and each carrier. NTX provides each shipper a report showing savings from using NTX. The report compares the shipper's expected price to NTX's transacted price. NTX reports also allow load tracking down to the stock keeping unit (SKU) level. NTX helps carriers manage accounts receivable by reducing the number of accounts carriers have to collect. Carriers receive bi-monthly checks from NTX for all NTX tendered shipments.

Unlike many other B2B e-marketplaces, NTX does not charge shippers or carriers membership fees. Joining NTX is free. NTX makes money by taking a percentage of each tendered load's cost. For example, a shipper may post a load they are willing to pay a carrier \$1,000 to transport. When carriers view the load on NTX's website, they do not see the \$1,000 the shipper is willing to pay, but a shipping price reduced by NTX's fee. This mechanism allows both parties to obtain what they consider the load's market price, while allowing NTX to receive their fee.

Joining NTX requires carrier certification. Passing certification requires maintaining insurance and current inspection. Carriers and shippers must also follow NTX's business rules. Carriers must pick up and deliver loads on time and in good condition. Shippers must have loads ready for pick up at the specified time. Violating these business rules results in a \$200 NTX imposed fine. NTX also has a "three strikes you're out" rule. If a party violates these business rules three times, NTX bans further participation.

Based on the Internet, anyone with an Internet connection and a portable computer can access NTX.

#### 6.1.2. Evaluation

Operating since 1995, NTX has over 2,500 shippers and carriers (NTE 2002a, NTE 2002b), tendering over 10,000 transactions daily. All these tendered transactions do not exactly occur in a pure open B2B e-marketplace scenario. NTX started as a pure open B2B e-marketplace matching shippers and carriers. However, when their customers requested using the marketplace to solicit quotes and procure freight from the customers' existing carriers, NTX modified their marketplaces to accommodate this request. Now, a large number of transactions come from firms like Target and Dal-Tile who use NTX as an electronic facilitator for their existing carriers. In this scenario, if a firm's existing carriers aren't available, the firm uses NTX to procure freight from another set of company-selected carriers. If this tier of carriers is unavailable, firms post loads to the open marketplace for pick up by any carrier.

This changing use and definition of a B2B e-marketplace accounts partially for NTX's success in getting shippers and carriers to join and use NTX. Early on, NTX had a difficult time getting carriers and shippers to join. Shippers did not want to jeopardize their carrier relationships. Having a long history of doing business together, shippers trust their carriers to deliver their products on time and in good condition. Shippers believe these relationships will make the carriers available when the shippers are "in a bind" and need to ship something fast and far. On a personal level, people working for

shippers and carriers had gotten to know one another in the freight tendering process. They did not want to replace these personal relationships with a computer-facilitated process.

Carriers oppose joining NTX because adding a middleman facilitating easy price comparison intuitively lowers carrier profits. Carriers discourage shipper NTX use emphasizing the importance of shipper-carrier relationships, especially when shippers need something special. Carriers also emphasize trust explaining their history in delivering products on time and intact.

NTX began achieving significant shipper and carrier membership after the year 2000 (Y2K). NTX's membership doubled to 1,175 companies in the first quarter of 2001 compared to the first quarter of 2000. Post Y2K, many corporate information technology departments were under pressure to deliver some savings. Corporations had spent lots of money preparing for Y2K, and the mentality in many corporations was that all of this money had been wasted as companies and countries that didn't prepare for Y2K had no problems. Around this same time, NTX had hired sales representatives with transportation industry experience and contacts. These sales representatives showed large corporations like Target and Dal-Tile how they could save substantially by using NTX to manage freight procurement. These large shippers told their carriers they wanted to do business with them over NTX. Once these carriers joined NTX to maintain their large shippers' contracts, their excess capacity became available for other shippers using NTX. NTX trained shippers and carriers.

To NTX's surprise, less freight capacity has also contributed to their success in getting shippers and carriers to join and use NTX. In the aftermath of September 11, 2001, companies started reducing the size of their fleets. With less freight capacity available, freight rates increased. Many carriers were in long-term contracts with their shippers. Once the carriers saw freight rates increase, they began breaking their long-term fixed price contracts and using NTX because NTX was paying carriers better rates. In addition, shippers started using NTX because finding carriers was so difficult.

NTX thought excess freight was their biggest strength. In retrospect, freight shortages helped NTX achieve high membership and use.

A strategy NTX uses to continue to sell excess freight capacity in open-marketplace situations is not disclosing to shippers and carriers one another's identity. Carriers are only given shippers' addresses. From NTX's perspective, this keeps carrier sales people from soliciting this business from shippers. For carriers and shippers, in an effort to keep relationships from being damaged, this keeps each party from knowing the other is doing business over the marketplace.

#### 6.1.3. Marketplace Categories

Table 8 shows B2B e-marketplace categories that apply to NTX. Because unused truck capacity can be used across industries, NTX is a horizontal marketplace. Since NTX is open to any industry participant, it is a public B2B e-marketplace. The Boston Consulting Group report (Andrew et al. 2000) says industry consortia found public e-marketplaces. Even though venture capitalists founded NTX, we categorize NTX as public since being open to any industry participant is the salient characteristic of a public e-marketplace. Categorizing transportation as an operating supply, NTX fits Kaplan and Sawhney's (2000) maintenance, repair, and operation hub and yield manager categories. NTX enables both systematic and spot transportation purchasing. Public bidding electronic marketplaces facilitate supplier identification for asset capacity exchanges. Since NTX facilitates shippers identifying carriers with unused capacity from member firms, NTX is a public bidding marketplace. Owned by venture capitalists, NTX is an independently owned marketplace.

## 6. 2. PEGASUS

In 1999, utility industry deregulation was looming. Utilities had never faced competition. They were always able to pass expenses along to consumers with rate increases. They knew swift supply chain and purchasing improvements were necessary to survive in the approaching competitive environment. To prepare for deregulation,

utilities engaged supply chain consultants. Six utilities engaged Gary Cowans, a Houston, Texas-based Pete Marvick consultant, to help them prepare for deregulation. These six utilities supply 60% of North America's energy. Cowans realized the utilities had similar problems and solutions for one could help another. He also realized by working together streamlining supplier production costs, negotiating pricing, and improving purchasing practices, utilities could swiftly reduce operating costs. Utilities had to be careful about collaborating, as they did not want to violate the Robinson-Patman Act by being perceived as engaging in anticompetitive actions like price fixing. At this same time, corporate America was enamored with integrating the Internet into business practices. Wall Street was considering Internet initiatives in company evaluations. Many companies were coming together to do business with the Internet in B2B e-marketplaces. All of this led to twenty-one utilities forming a B2B e-marketplace for the utility industry -- Pegasus.

#### 6.2.1. Value Proposition and Business Model

Pegasus has not emphasized the B2B e-marketplace. They emphasize several value propositions believing marketplace use will result from value proposition adoption. Pegasus' value propositions include sourcing, auctions, business process services, and capital asset services. Pegasus also offers consulting services that help the utilities use the e-marketplace to improve their supply chain. Table 9 shows Pegasus' value propositions by use level and revenue source. Pegasus' business model includes an array of revenue sources for each value proposition.

**Table 9 Pegasus' Service Offerings: Volume and Revenue Source**

SERVICE OFFERING	SOURCING	AUCTIONS	BUSINESS PROCESS SERVICES	CAPITAL ASSET SERVICES
VOLUME	Not available	Moved over \$700 million in transactions	3-10 companies use hourly	5,000 companies use daily
REVENUE SOURCE	Term-based commission	Event-based commission and base rate	Not available	Commissions, transactions, and subscriptions

**Sourcing** refers to purchasing items and includes private and collaborative purchases. Private sourcing involves purchasing specific items for specific companies. One example is meters. A utility that needs to purchase meters can engage Pegasus to negotiate the meter contract. This arrangement occurs under the premise that because Pegasus employees have worked for the meter supplier, Pegasus can negotiate better pricing than a utility. Collaborative sourcing occurs when Pegasus works with a number of utilities that need the same product or service from the same supplier. Pegasus works with the utilities to streamline their product specifications and works with suppliers to reduce supply chain costs. An example is Pegasus' work with six utilities and a wood pole supplier. All six utilities use wood poles to deliver electricity; however, each utility gives the supplier different production specifications. For example, some want pointed poles and some want poles with resin. Producing this array of specifications increases manufacturer production costs. Pegasus facilitated the utilities and the manufacturer coming together to create standardized product specifications for all six utilities, reducing supplier production costs, and lowering utility pricing. For sourcing, Pegasus receives a commission based on the utilities' savings over the contract term.

Pegasus' **auctions** are electronic bidding implementations of traditional auctions. Pegasus facilitates several auction types, including forward, reverse, single, and multivariable. In a typical auction, the utility will notify their suppliers that they are looking for bids on producing an item, such as a dragline. Traditionally, suppliers submitted sealed envelope bids. The utility evaluated the bids and chose a supplier.

Using an auction, the utility notifies suppliers about the auction. The utility and the suppliers sign on to Pegasus' auction system. Suppliers enter their bids. Suppliers can see their bid and everyone else's bid. However, they do not know who is bidding what amount. Suppliers can lower their bid. After a specified period of time, the auction ends and the utility chooses a supplier to manufacture their product. As of June 2002, Pegasus had facilitated several hundred auctions, around 30 per month, moving over \$700 million dollars in auction transactions. Pegasus charges for auction facilitation on an event basis, but is moving towards charging a monthly fee for auction capabilities.

**Business process services** help utilities solve an array of problems including virtual inventory, request for proposal, and workforce management. Virtual inventory gives utilities visibility of available inventory in the industry. This is useful because in providing electricity sometimes unforeseen events occur and utilities need electrical infrastructure quickly. For example, in repairing hurricane damage in Florida, the virtual inventory service allows Florida utilities to see if other utilities have available electrical infrastructure. Request for proposal automates traditional proposal processes by allowing utilities to electronically contact suppliers with business opportunities. Suppliers then enter their proposal online for utility evaluation. Workforce management helps utilities manage temporary workers, including required skills and time worked. Pegasus estimates that between three and ten utilities use business process services hourly.

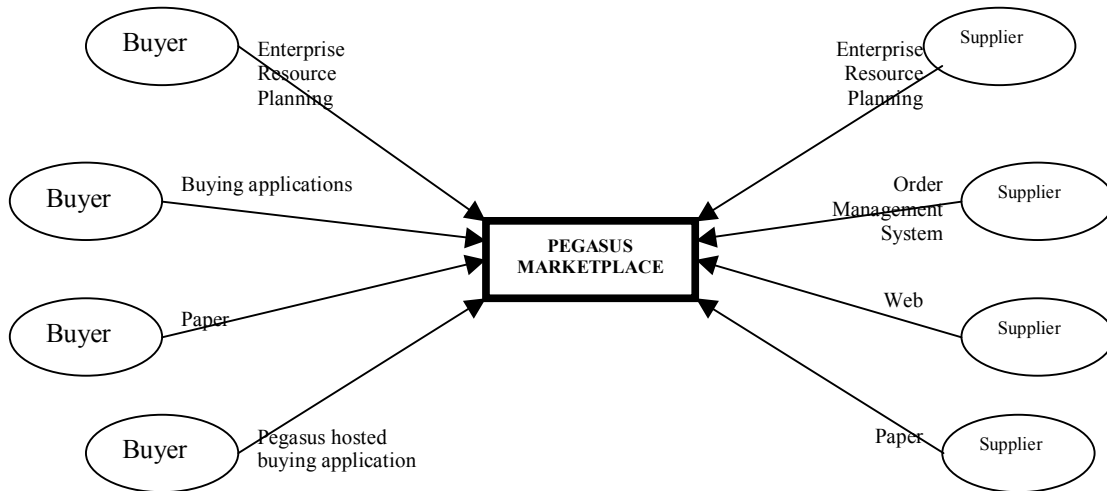
**Capital asset services** is similar to virtual inventory, but is used for capital-intensive assets. Utilities use capital asset services when they need something and their supplier is unable to produce it in the time period needed. Often, suppliers require several years lead time to produce utility assets like turbine engines. For example, Pegasus helped a utility in Australia in need of a turbine engine secure one from a utility in Turkmenistan. Currently 5,000 companies use Pegasus' capital asset services daily. Pegasus does not include these companies in their number of marketplace members. Pegasus charges based on commissions, transactions, and subscriptions.

Pegasus' value propositions adopt a different view of the traditional B2B e-marketplace. Traditionally, B2B e-marketplaces focus on bringing together populations of buying and selling organizations. B2B e-marketplaces facilitate buyers shopping with the entire supplier population, easily comparing prices and products. E-marketplaces allow sellers to reach more buyers. Many companies with professional procurement people do not want their procurement people shopping and making "maverick purchases." They have prenegotiated supplier contracts and want their buyers to do business with those suppliers. This is the case in the utility industry. Given this, Pegasus' value propositions have developed around B2B e-marketplace implementations that allow buyers to see a limited number of suppliers and their company's prenegotiated contract pricing and products.

In forming Pegasus, the original twenty-one utilities put up \$100 million dollars in financing. Pegasus originally planned to charge suppliers a membership fee to join. Even though the fee was minimal, the suppliers resented the idea. As a result, supplier membership in Pegasus is free.

Figure 9 shows Pegasus' marketplace technology. Buyers and suppliers can connect to the Pegasus marketplace using an array of technologies. Buyers and suppliers do not have to use the same technology. A buyer can use one type of technology and a supplier can use a different type.



**Figure 9 Pegasus' Marketplace Technology**

### 6.2.2. Evaluation

Since opening for business January 2001, Pegasus has achieved total deal flow of \$780 million and over 200,000 transactions (Staff 2002). During the three months prior to our June 2002 field visit, Pegasus was averaging 1,000 transactions/day. With over four hundred buyers and suppliers, Pegasus has achieved some success in attracting members. However, Pegasus is struggling to achieve consistent, repetitive e-marketplace use.

Several factors contribute to Pegasus' ability to attract members. First, Pegasus' timing was good. Pegasus formed in the height of the economic boom. Utilities had money to invest in new projects. Twenty-one utilities invested \$100 million to join Pegasus. Second, Pegasus was seen as a solution to a pressing industry problem—upcoming deregulation. Utilities felt they had to join Pegasus to improve their procurement practices and prepare for deregulation. Third, Pegasus formed in the height of the EC boom when Wall Street was rewarding companies for EC involvement and punishing those without EC strategies. Utilities saw Pegasus' membership as a way to

develop an EC strategy. Fourth, since utilities have historically not competed with one another, they were comfortable collaborating and had long-term relationships with one another. They did not mind being part of an e-marketplace in which their future competitors were participating.

Even though Pegasus attracted many members in record time, Pegasus has faced a number of challenges. The most recent being the October 2002 resignation of their founder and Chief Executive Officer, Gary Cowans (Staff 2002) and the 50% turnover in the executive team between June 2002 and March 2003.

Influencing member utilities to use Pegasus has been a challenge. When the Pegasus marketplace was originally introduced in January 2001, the marketplace was not as efficient as the utilities' existing procurement procedures. The marketplace's interface was similar to Amazon.com. This interface required buyers to search for every item that they wished to purchase from the marketplace's online catalogue. For direct, frequently used materials (e.g., transformers and poles) the utilities' existing systems are more automated. Engineers use computer-aided design/computer-aided manufacturing to draw pictures of needed utility infrastructure. The engineer then hits a button and an order to strategic vendors is automatically placed at prenegotiated prices. For these types of products, the utilities' existing procurement practices were much more efficient than Pegasus' original interface and offerings.

The other use challenge is utility buying practices. Because utilities purchase many products and services, they have professional procurement shops comprised of professional buyers. Buyers negotiate long-term purchasing agreements with suppliers. Purchasing agreements include price, delivery, and quality, but over time also include noncontractible services like in-warehouse stocking and supplier innovation on behalf of the utility. The relationships developed as part of these agreements are long-term. The utilities know their suppliers and the suppliers know the utility. Both feel they can count on one another. The premise of the traditional B2B e-marketplace business model is enabling a buyer to compare many suppliers. Utility suppliers did not like this model as it forced them to compete on price alone. They argued that they currently deliver more

value to their customers than can be measured with price. Utilities also did not want to jeopardize their supplier relationships for a cheaper supplier as they realized the noncontractible services in their existing supplier relationships were more important than choosing the cheapest supplier.

Given that utility procurement departments preselect suppliers and prenegotiate supplier pricing, the concept of an open B2B e-marketplace where any buyer can purchase from any seller does not work in most situations. Utilities want to do business with and maintain their long-term relationships with preselected suppliers. Utilities do not want their buyers shopping suppliers to obtain a “better deal.” Because these industry practices conflicted with Pegasus’ open e-marketplace concept, Pegasus had difficulty influencing member organizations to extensively use the marketplace.

Pegasus’ main advantage in overcoming these challenges is the way they approached the marketplace. Unlike many other B2B e-marketplaces, Pegasus did not focus on the technology. They concentrated on solving supply chain problems and viewed the e-marketplace as the enabler; the transaction layer. Pegasus’ staff is primarily composed of utility industry people, not technology people. Pegasus assigns representatives to help each utility use Pegasus to solve their supply chain problems. Once Pegasus gets the utility working with them on the supply chain problem, e-marketplace use follows. All of this change takes time. Often, Pegasus provides the utilities with a supply chain solution, such as streamlining buyer specifications on wood poles, and then collects a percentage of the savings on the solution. The idea is that ultimately the utilities will use the marketplace to procure wood poles. But, in the meantime, Pegasus collects a percentage of the savings from the wood pole solution. These types of revenue agreements have sustained Pegasus as they struggle with getting organizations to use the e-marketplace. Only time will tell whether Pegasus succeeds.

### 6.2.3. Marketplace Categories

Table 8 shows B2B e-marketplace categories describing Pegasus. Since Pegasus focuses on the utility industry, providing members industry specific products,

knowledge, and collaboration opportunities, Pegasus is a vertical marketplace. Founded by an industry consortia and open to any industry player, Pegasus is a public marketplace. Kaplan and Sawhney's (2000) categories do not describe Pegasus since Pegasus does not focus on manufacturing inputs and is a vertical market. Pegasus enables price aggregation since utilities can purchase large quantities and frequently ordered items from preselected suppliers and fixed prices. Pegasus enables private negotiation where utilities procure production inputs at dynamic pricing using prescreened suppliers. Pegasus also enables public bidding allowing utilities to identify suppliers from member firms for asset capacity exchanges. Utilities use asset capacity exchanges when electricity infrastructure is down in one area because of unforeseen circumstances (e.g., tornado). Formed by twenty-one utilities in the United States, Pegasus is partly participant-owned. Member utilities have stock in and three rotating seats on Pegasus' board. Four board members are not utility representatives. Pegasus has a governance process separate from the member utilities.

### **6. 3. C-STORE EXCHANGE (CSX)**

Gulf Coast Oil's retail sales manager, Karen Longoria, was struggling managing over 8,000 Gulf Coast Oil convenience stores, 1,000 Gulf Coast Oil owned and 7,000 franchisees. Some Gulf Coast Oil stores were clean, had in-stock, in-date, nicely displayed, and accurately priced products, and friendly clerks, and some were not. Longoria's struggle was communicating timely product, price, promotion, and display information to store owners in a cost-effective manner. Nearly 5,000 of the Gulf Coast Oil franchise stores were independently owned, meaning each store had a different owner. In 1998, she toyed with using a company intranet connecting store managers to a Gulf Coast Oil home page. The Gulf Coast Oil home page would include a Gulf Coast Oil President's message, store operation advice, product display information, current fuel prices, and product promotions.

In 1998 Longoria's group started working on this idea. In the process of bringing these stores together to share information, they realized by representing 8,000

convenience stores, they could negotiate better supplier and distributor pricing than any store could individually. The Gulf Coast Oil Retailer's Alliance formed. Some of the Gulf Coast Oil franchisees owned several convenience stores, each flying different flags (e.g., Mobil, Texaco, Phillips 66). These franchisees wanted to use the Gulf Coast Oil tools and pricing in their non-Gulf Coast Oil stores. Longoria realized the Gulf Coast Oil's Retailer's Alliance needed to be bigger than Gulf Coast Oil. It needed to be for the entire convenience store industry. The CSX idea formed.

At the time Gulf Coast Oil realized the need for CSX, they were also evaluating their distributor contract. Because convenience stores individually buy small amounts of a number of products, supplier delivery directly to stores isn't cost effective. Suppliers deliver products to distributors and distributors deliver products from an array of suppliers to convenience stores. Gulf Coast Oil evaluates their distributor contract every three years and, based on price, performance, and fit, selects a distributor to service their company-owned and franchise stores. As retail sales manager, Longoria was also in charge of the distributor selection group.

The 8,000 Gulf Coast Oil stores would represent a significant part of any distributor's business. The convenience store industry has two primary distributors: Cosco Distributing and McMurray Distributing. Cosco Distributing, Gulf Coast Oil's current distributor, depended on the contract. McMurray Distributing wanted the contract. At the time the distributors' were presenting Gulf Coast Oil their bids, Gulf Coast Oil was looking for CSX investors and members. Gulf Coast Oil presented the idea to both distributors in 1999, the beginning of the EC boom. Cosco Distributing had cash flow problems and didn't have money to invest. McMurray Distributing had money to invest. After hearing the idea, McMurray Distributing's Chief Executive Officer (CEO) decided McMurray Distributing would invest millions in CSX becoming part owner. McMurray Distributing also won Gulf Coast Oil's distributor contract, becoming distributor for the 8,000 Gulf Coast Oil stores.

Since CSX's goal was being a B2B e-marketplace for the entire convenience store industry, they needed to obtain the entire industry's involvement. They decided the

best strategy was having industry leaders join and lead the industry into the marketplace's use. McMurray Distributing was on board. CSX needed a big supplier so the marketplace would represent all industry players. Momentum Manufacturing has a big name, has cash, and McMurray Distributing is their biggest customer. McMurray Distributing's CEO called Momentum Manufacturing and asked them to join CSX. They agreed. Momentum Manufacturing was interested in becoming involved in EC and in supporting their largest customer. In March 2000, Gulf Coast Oil, McMurray Distributing, Momentum Manufacturing, and Big O announced CSX's formation.

CSX was heavily marketed. Karen Longoria, the President, went on media tours and talked to analysts about the marketplace. Nearly thirty news programs including: *Bloomberg News*, *Reuters News Service*, *Dow Jones*, and the *Wall Street Journal*, reported CSX's formation. Marketplace board members spoke at conferences, presented at trade shows, and visited high-ranking convenience store industry executives. CSX's President has a notebook three inches high with business cards of executives called on in soliciting organizations to join CSX.

#### 6.3.1. Value Proposition and Business Model

CSX's value propositions focused on improving convenience store industry business practices through increased Internet-supported communication. Many convenience stores exist. Many are major oil company (e.g., Gulf Coast Oil, Texaco, Mobil) franchisees. Each store is owned and operated by a single person. The major oil companies that own the brand need to communicate retail best practices to each convenience store. Suppliers need to share promotion and optimal product display information. Sharing this information is difficult for both groups because convenience stores are geographically dispersed. Currently, suppliers share this information through distributors who then communicate with each convenience store.

CSX offered ways to cost-effectively communicate information to convenience stores, in order to improve operations. Envisioned as the Yahoo! of convenience retailing, CSX was a central website retailers could log on to access current fuel and

product prices, product promotions, new product information, product display advice, and order placement screens. CSX would also collect information helping retail stores analyze their business. The marketplace would allow retail stores to benchmark sales by product type and category, for an array of time periods, and productivity measures (e.g., fuel sales per hour in June compared to other stores in the same area).

CSX's supplier value propositions included lower cost structures, market growth, and improved information. Lower cost structures would come from using the marketplace to communicate product and promotion information to convenience stores. The Internet is less expensive and more timely than traditional supplier-distributor-retailer communication channels (e.g., physical visits, phone calls, mail). CSX would not replace other communication channels, but would supplement and lower their use. Currently, in the convenience store industry, convenience store to end consumer sales data is unavailable. CSX planned to capture this data facilitating supplier sales growth and decision-making. Cigarettes are high cost, high profit items. Manufacturers periodically run cigarette promotions, giving retailers money for cigarette cartons sold during promotion periods. Promotions represent substantial retailer profits. In the convenience store industry, currently promotions are handled by sending supplier field representatives to each convenience store to count on hand inventory before and after promotions. Promotions are paid by adding physical beginning inventory to purchases and subtracting physical ending inventory. Sending field representatives to each store is expensive and presents fraud opportunities by manipulating on-hand cigarette inventory. By capturing end consumer sales, CSX would automate and increase promotion efficiency. By gathering information on end consumer sales, CSX would improve supplier and distributor information facilitating retail stores product deliveries and crafting promotions that increase product sales.

CSX was a B2B e-marketplace open to the entire convenience store industry. Industry organizations could purchase equity ownership and be involved in running CSX. For convenience stores, access to CSX required a monthly per store fee. For example, an owner of seven convenience stores would pay \$100 per store per month to

access CSX. Suppliers would pay a monthly fee to access aggregated end consumer sales data. The business model anticipated revenue generation from an array of sources. Most of CSX's revenue would come from fees for content management, transactions, cash management, and auctions. Twenty-five percent of revenue would come from providing data aggregation and access services, retail business operating software, and hosting supplier business operating services. Advertising and consulting fees would make up less than five percent of projected revenues.

CSX intended to use the Internet, portable computers, scanning technology, and Big O B2B e-marketplace technology. CSX had their own technology department and would work with customers to customize the marketplace to integrate with their back office systems.

#### 6.3.2. Evaluation

In March 2000, Gulf Coast Oil, McMurray Distributing, Momentum Manufacturing, and Big O announced a joint venture creating a convenience store industry B2B e-marketplace. The announcement hit nearly thirty news sources including *Computerworld*, *Bloomberg*, and the *Associated Press*. In October 2002, the CSX website read "the CSX team has decided to discontinue software and services on October 31,2002." A March 2003 Internet search for CSX showed nothing. A number of events contributed to CSX's collapse.

Lack of investor commitment resulting in hardly any investor marketplace use was a key contributor to CSX's collapse. The vision was that McMurray Distributing and Momentum Manufacturing would not only invest in, but also use CSX to conduct business. These companies would lead the convenience store industry into using CSX to adopt more efficient business practices. When CSX contacted companies about joining the marketplace, these organizations would frequently say, "your investors aren't using the marketplace, why should we?" Because the investors weren't using, other organizations wouldn't join, and CSX was never able to attract additional buyers and sellers to use the marketplace.



McMurray Distributing's CEO made the decision for McMurray Distributing to invest in CSX. This decision was fueled by a desire to win the Gulf Coast Oil service agreement and a desire to venture into e-business. Changing McMurray Distributing's business practices for McMurray Distributing to potentially use CSX required support and coordination among a number of McMurray Distributing's business processes. This depended on buy-in from two of McMurray Distributing's Senior Vice Presidents among others. Neither of these individuals supported the initial CSX investment. The Senior Vice President who McMurray Distributing's CSX board member reported to told CSX's President one month into the project, "we have no intention of requiring our customers to use CSX." Another McMurray Distributing Senior Vice President was unwilling to help CSX capture data showing retailer sales to the final consumer. Capturing this data was critical to CSX's value proposition.

McMurray Distributing and Momentum Manufacturing were both interested in CSX as a way to become involved in e-business. In January 2001, the economy slowed and the "dot.com" bubble burst. When this happened, both companies' interest dwindled further. Neither company wanted to commit too many more company resources to CSX.

Board representation was the final straw leading to CSX's collapse. CSX grew out of Gulf Coast Oil. Gulf Coast Oil retail stores were the primary users. CSX became a separate company because Gulf Coast Oil's competitors would never join a Gulf Coast Oil-owned marketplace. When CSX separated from Gulf Coast Oil, internal Gulf Coast Oil champions became CSX's senior management. The wall between the Gulf Coast Oil retail group that used CSX and CSX widened. CSX had limited information on what was going on in Gulf Coast Oil or what the CSX customers needed. One member of Gulf Coast Oil management was on CSX's board. Initially, this board member represented the Gulf Coast Oil group using CSX. Because of something that happened with another Gulf Coast Oil marketplace, Gulf Coast Oil decided to separate board representation and user representation, so that the group using the marketplace was not represented on CSX's board. Gulf Coast Oil's new board representative did not believe

in the CSX concept and began making efforts for CSX to stop trying to be a convenience store industry e-marketplace. As a result of this, the board decided to sell CSX. They found a buyer. When the Gulf Coast Oil retail group using CSX heard the marketplace was changing ownership, they said “hold on, we’re not sure we want to do business with the new owners.” The potential owners only wanted to buy CSX because Gulf Coast Oil was using it. This stopped the deal. CSX’s close became a self-fulfilling prophecy. Having wind CSX was selling out, the Gulf Coast Oil user group began shopping for another company to provide their marketplace services. Without the Gulf Coast Oil contract, no investor wanted to buy CSX.

#### 6.3.3. Marketplace Categories

Table 8 shows B2B e-marketplace categories that apply to CSX. Providing specialized products, knowledge, and collaboration opportunities for the convenience store industry, CSX is a vertical marketplace. Founded by leading convenience store industry organizations and open to the industry, CSX is a public marketplace. Since CSX does not focus on horizontal markets and does not provide manufacturing inputs, Kaplan and Sawhney’s (2000) categories do not apply. CSX’s vision involves enabling buyers purchasing large quantities and frequently ordered items from preselected suppliers at fixed prices. This makes CSX a price aggregation marketplace (Dai and Kauffman 2001). Since CSX’s founders owned CSX, CSX is participant owned.

### 6. 4. RETAIL MATRIX

Between late 1999 and early 2001, B2B e-marketplaces were very popular with organizations exploring e-business opportunities in efforts to stay abreast of current trends and remain competitive. Fueled by an environment pushing e-business, in October 1999, the convenience store industry’s trade organization, the United States Convenience Store Association, began exploring industry EC opportunities. At this same time, I3 Technologies was helping companies launch industry B2B e-marketplaces throughout the United States. In October 1999, I3 Technologies approached the United

States Convenience Store Association about forming a convenience store industry B2B e-marketplace. After evaluating the value propositions and considering the environmental push toward EC, the United States Convenience Store Association partnered with I3 Technologies and Sales Point Ltd. to form Retail Matrix, a B2B e-marketplace for the convenience store industry.

The United States Convenience Store Association began exploring the Retail Matrix idea in 1999. They did not decide to create Retail Matrix until April 12, 2000. In August 2000 Retail Matrix became a legal entity. Between April and August of 2000, the United States Convenience Store Association began sharing the marketplace concept with their members. However, official marketing did not begin until Retail Matrix's August 2000 incorporation.

Retail Matrix used a number of approaches to solicit membership. On March 30, 2000, the United States Convenience Store Association held a supplier's summit, marketed as an information conference teaching suppliers about B2B e-marketplaces and EC in general. At this time, businesses wanted to know more about EC, which was a "hot topic." The United States Convenience Store Association used the summit to announce and solicit supplier membership in Retail Matrix. The summit invited only suppliers as in the convenience store industry suppliers have more resources than retailers to help finance such initiatives. At the October 2000 United States Convenience Store Association trade show, Retail Matrix had a booth with a continuously running presentation explaining Retail Matrix. Other marketing efforts included: two workshops; industry trade publication articles; and an ambassador panel, comprised of United States Convenience Store Association members.

Retail Matrix's envisioned ownership structure was 15% technology partners, 15% United States Convenience Store Association, 55% industry players, and 15% employees. However, throughout its life Retail Matrix's founders were the only owners.

#### 6.4.1. Value Proposition and Business Model

Retail Matrix was envisioned as a virtual location for the convenience store industry to conduct business and share information. The convenience store industry is fragmented, with 50% of the 124,000 existing convenience stores representing single stores each owned by one person. As such, most manufacturers do not directly communicate with convenience store owners. They depend on a distributor, delivering products from an array of manufacturers, to communicate with each convenience store. Currently, distributors have sales people physically visiting convenience stores making convenience stores aware of new products, prices, and promotions. Distributor trucks then deliver orders to each convenience store. Retailers place orders a variety of ways including giving to a salesman, calling, punching into a telxon unit attached to the telephone, faxing, using electronic data interchange, and using the Internet.

Retail Matrix's value propositions aimed to make these business practices more efficient with the goal of increasing sales and lowering costs. Transaction data and a product analysis database would form the heart of Retail Matrix. The marketplace had procurement, content, merchandising, and active service provider segments. Retail Matrix offers industry, supplier, and retailer value propositions. For the industry Retail Matrix promised improved integration and tighter alignment, increased collaboration, reduced supply chain costs, enhanced growth, and improved financial performance.

Retail Matrix offered several supplier value propositions. As a virtual platform for all convenience store industry participants, Retail Matrix would increase supplier alignment and integration of major business processes with trading partners. As a central portal for the entire convenience store industry, Retail Matrix would help suppliers reach new customers and markets more efficiently. Providing transaction data, Retail Matrix will allow suppliers to access aggregated retailer consumption and profitability data to support strategic marketing and merchandising decisions. In the convenience store industry, currently, suppliers do not have records of consumer purchases from the retail store. Providing suppliers, data on retail store sales to the end-consumer, would support a continuous replenishment loop in the convenience store

industry. Based on preselected stock levels, this would allow automatic order generation from the convenience store to the supplier and from the supplier to the real manufacturer.

Retail Matrix's retailer value propositions would provide retailers information. Retail Matrix would offer retailers access to industry expertise and content to better manage their business. One example is providing information on displaying products to increase sales. Retail Matrix also would provide a forum to evaluate products. This forum would be open to all retailers and would give retailers better information to select products and services. Currently, convenience stores have difficulty learning about new products and promotions because current business practices do not facilitate manufacturers communicating with convenience stores directly. By bringing retailers together to purchase products, Retail Matrix would increase retailers' buying leverage. Retail Matrix would list all the convenience store software providers and provide a forum for retailers to download updates to industry software used to run their business. The ability to quickly access software updates as opposed to waiting for the newest release would improve operating efficiency and reduce information technology costs.

Retail Matrix's value propositions hinged on Retail Matrix being an open and competitive B2B e-marketplace for the convenience store industry. The marketplace would be a central virtual location providing collaboration, commerce, content, community, and connectivity. A number of items could be traded over Retail Matrix, including software, services, and products for the convenience store industry. However, the main focus of Retail Matrix was providing information about industry products and services. Intended participants included all members of the convenience store supply chain. This includes manufacturers, distributors, retailers, and service providers.

Retail Matrix planned to gain initial funding by selling intended participants equity ownership in the marketplace. Retail Matrix's business model involved charging participants monthly membership fees. For retailers, fees were tiered contingent upon the level of service the retail store wanted from Retail Matrix. Fees were assessed on a per store per month basis. Manufacturers and distributors would also pay a monthly fee

for Retail Matrix's services. The fees were contingent on the manufacturer's volume through the subscribed service. Available services include point of sale aggregation services and planning services. Retail Matrix would also collect marketplace-advertising revenues.

Retail Matrix was based on Commerce Matrix, a B2B e-marketplace technology developed by I3 Technologies. Commerce Matrix is a standard B2B e-marketplace customizable by industry. I3 Technologies has used Commerce Matrix to create over forty e-marketplaces in an array of industries. Retail Matrix was envisioned as a central hub that B2B e-marketplace participants could connect to using a combination of their existing information systems and Internet technology. Retail Matrix use requires a portable computer, a point of sale scanner, an Internet service provider, and Retail Matrix software.

#### 6.4.2. Evaluation

Table 7 at the beginning of this chapter shows Retail Matrix was the least successful B2B e-marketplace in the study, as measured by existence period, number of participants, and use. The Retail Matrix idea was hatched in late 1999 with the three partners deciding to go forward with the marketplace in April 2000. In August 2000, Retail Matrix became a legal entity. Between April and August, Retail Matrix's founders introduced the marketplace to the industry, but could not sign members since Retail Matrix was not yet a legal entity. The timing hurt Retail Matrix's membership solicitation efforts in two ways. First, businesses were very interested in EC in 2000. However, the tide turned in 2001 when the stock market stopped rewarding "dot.coms" for ideas and started evaluating them on traditional financial metrics. Retail Matrix had only a few months of "boom time" to garner marketplace support before the bottom fell out. Second, CSX, a competing marketplace in the convenience store industry, announced their existence in March 2000. Being the first convenience store industry marketplace, CSX had a six-month jump soliciting members. In addition, both convenience store industry marketplaces were trying to garner supplier support for their

marketplace. In the industry, suppliers have more resources to support initiatives. Unfortunately, fifty of these suppliers had already invested in Transora, a B2B e-marketplace focusing on links in manufacturers' supply chains. By the time Retail Matrix began soliciting membership, Transora had burned through their initial funding and had put out another cash call to the same suppliers Retail Matrix was soliciting. Since the suppliers were already involved with Transora, they further funded Transora in hopes this would help recoup their initial investment.

Too many marketplaces in the market space also hurt Retail Matrix's ability to attract members. Potential members were concerned because two marketplaces claimed to be central hubs to conduct all business in the convenience store industry, both requiring membership fees. Suppliers and retailers were confused as to which one would be the industry marketplace and did not want to pay to participate in both. Many decided to wait and see which marketplace the convenience store industry was going to adopt.

Two technology companies and the industry trade organization formed Retail Matrix. Retail Matrix was unable to influence any industry suppliers, distributors, or retailers to join the marketplace. Since Retail Matrix did not have any members routinely buying and selling convenience store industry products, Retail Matrix was unable to conduct any business transactions or leverage any transactional relationships to require organizations to join.

The other problem was influencing industry participants to even be willing to participate in an open marketplace. The convenience store industry is very competitive and Retail Matrix found, in many cases, industry organizations did not want to be in the same marketplace as their competitors. In the EC heyday, a number of convenience store marketplaces formed along the supply chain. The marketplaces were supposed to be open, but most had traditional business partners: a few suppliers, one distributor, and one retailer. For distributors, Retail Matrix offered no real value proposition. The distributors saw Retail Matrix as adding yet another way to have to do business with their customers. In addition, increasing retailer awareness of new products would cause

distributors to have to carry these products. Carrying more products raises distributor operating costs. As such, distributors prefer to carry fewer products. Suppliers were concerned Retail Matrix would upset their industry power. Suppliers have the power in the convenience store industry because they are large corporations and 50% of the 124,000 existing convenience stores in the United States are one-store one-owner operations. Because of their low purchase volume, convenience stores independently have little negotiating power with suppliers. Suppliers were concerned about Retail Matrix facilitating these stores coming together to gain purchasing leverage with them.

Retail Matrix's competitive advantage was having the trade organization as an equity owner. In theory, the United States Convenience Store Association's sponsorship should have helped Retail Matrix attract members, since the trade organization has relationships with all industry organizations. In reality, trade organization ownership wasn't enough to achieve membership and actually complicated membership criteria. Many industry players, especially industry software providers, opposed Retail Matrix offering a platform to rate products and advertise industry services. These groups openly opposed the idea of a trade organization sponsoring a marketplace. As Retail Matrix tried to design a marketplace meeting the varying interests of the trade organization's members, the marketplace's speed to market was delayed. In addition, incorporating the varying interest of the trade organization's members eliminated many viable marketplace offerings that the powerful trade organization's members opposed.

#### 6.4.3. Marketplace Categories

Table 8 at the beginning of this chapter shows B2B e-marketplace categories applying to Retail Matrix. Retail Matrix focuses on providing the convenience store industry specialized products, knowledge, and collaboration opportunities. This makes Retail Matrix a vertical marketplace. Founded by the United States Convenience Store Association and two technology partners, Retail Matrix is open to all industry participants, making Retail Matrix a public marketplace. Since Retail Matrix does not focus on horizontal markets and does not provide manufacturing inputs, Kaplan and



Sawhney's (2000) categories do not apply. Retail Matrix's pricing practices and supplier identification procedures do not fall into any of Dai and Kauffman's (2001) E-marketplace categories. Retail Matrix proposes buyers selecting from all possible suppliers and obtaining dynamic pricing. Retail Matrix intended member ownership.

## **CHAPTER VII**

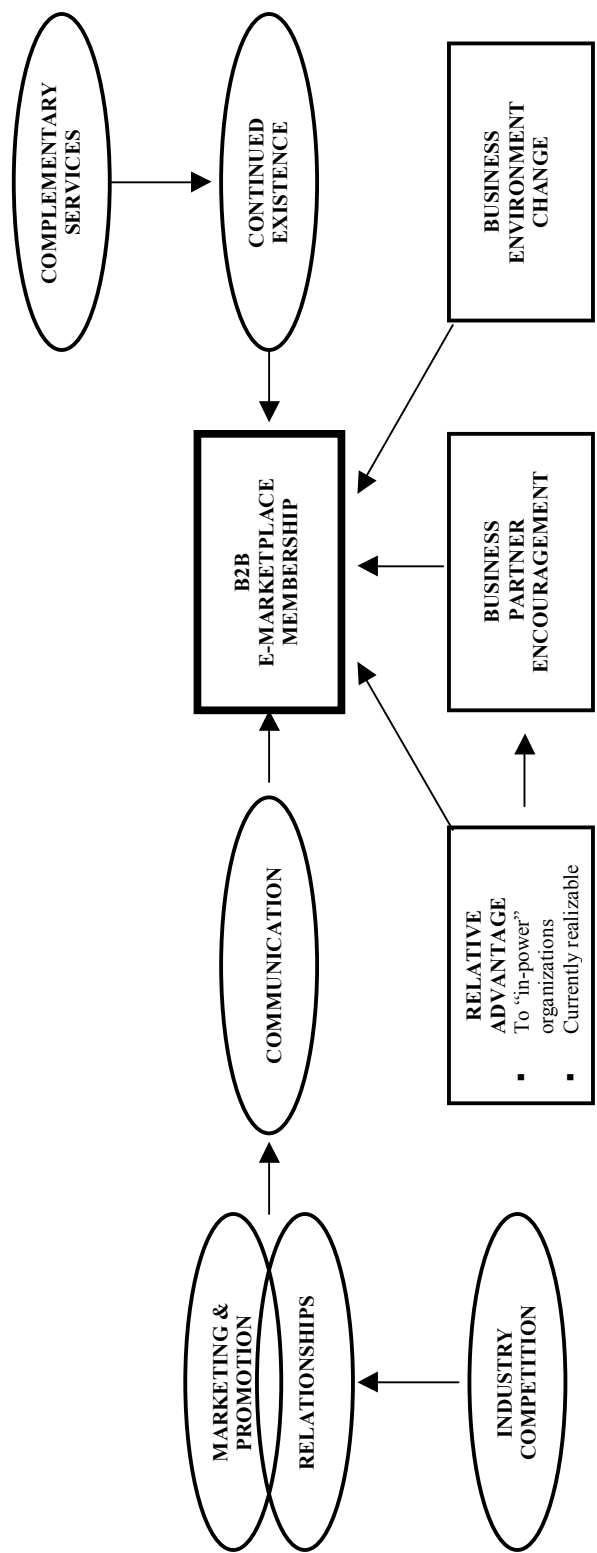
### **RESEARCH QUESTION 1: WHAT DRIVES BUSINESS-TO-BUSINESS ELECTRONIC MARKETPLACE MEMBERSHIP?**

Based on preliminary field observations, Figure 4 presents the original research model of what drives business-to-business (B2B) electronic marketplace (e-marketplace) membership. Extensive field research and field note analysis indicate Figure 4 does not explain what drives B2B e-marketplace membership. This chapter presents and discusses the revised research model, Figure 10. This model is based on field data analysis comparing membership levels and drivers:

- within each of the four B2B e-marketplaces, and
- between the two higher membership and the two lower membership B2B e-marketplaces.

The revised model proposes some different drivers than the original model and considers relationships between drivers. The revised model posits motivating drivers and facilitating drivers. Motivating drivers indicate reasons organizations join e-marketplaces. Facilitating drivers indicate conditions that help with marketplace membership. Motivating drivers include relative advantage, business partner encouragement, and business environment change. If the marketplace offers a relative advantage that is currently realizable to “in-power” organizations, these organizations will become members and then encourage their business partners to join. An environment change is also a motivating driver of marketplace membership. An environment change facilitates marketplace membership if organizations view marketplace membership as a means of dealing with the environment change.

Figure 10 Model of B2B E-marketplace Membership Drivers



Key:

Motivating Drivers:  Facilitating Drivers: 

Communication facilitates marketplace membership. Relationships and two marketing and promotion aspects facilitate communication. Industry competitive nature affects relationships. Organizations' e-marketplace membership and use decisions take time. As such, the e-marketplace's continued existence facilitates marketplace membership. Complementary services facilitate continued existence. Table 10 evaluates the model's drivers. Each row in Table 10 corresponds to this chapter's model. Table 10 also evaluates supplemental dimensions of the model's drivers. The chapter's text follows the table.

The conclusion discusses drivers in the original model not included in the revised model, theoretical implications, practical implications, and future research avenues.

**Table 10 Comparison of B2B E-marketplace Membership Drivers**

DRIVER	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)	RETAIL MATRIX
NO. OF MEMBERS:	Over 2,500	Over 400	4	3
<i>MOTIVATING DRIVERS</i>				
RELATIVE ADVANTAGE	Yes	Yes	Yes	Yes
Substantial to organization's "in-power"	Yes	Yes	No	No
Currently realizable	Yes	Somewhat	For corporate-retailer communication	No
<i>BUSINESS PARTNER ENCOURAGEMENT</i>	Yes	Yes	McMurray Distributing encouraged Momentum Manufacturing	No
<i>BUSINESS ENVIRONMENT CHANGE</i>				
EC encouragement	Yes	Yes	Yes	Yes
Other business	Yes	Yes	No	No

**Table 10 Continued**

DRIVER	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)	RETAIL MATRIX
environment change				
<i>FACILITATING DRIVERS</i>				
COMMUNICATION				
Marketing and Promotion Level	High	Low	High	High
Marketing and Promotion's Effect on Membership	Strong	None	None	None
Industry sales representatives	Yes	Yes	Yes	Yes
Education on using the marketplace	Yes	Yes	No	No
Relationships				
Relationships as a communication driver	Yes	Yes	Yes	Yes
Regard for maintaining existing relationships	Yes	Yes	Not mentioned	Not mentioned
Marketplace adapted to support existing relationships	Yes	Yes	No	No
Industry competition	Sellers: competitive; Shippers: represent different industries	Buyers: regulated; sellers: some competition	Competitive	Competitive
Ownership structure	Independent	3 of 7 board seats owned by participants	Participant-owned	Participant-owned
MEANS OF CONTINUED EXISTENCE	Yes	Yes	Tried	No

## 7.1. MOTIVATING DRIVERS

### 7.1.1. Relative Advantage and Business Partner Encouragement

The model posits relative advantage drives B2B e-marketplace membership. Rogers (1995, p. 213) defines perceived relative advantage as “the degree an innovation is perceived as being better than the idea it supersedes.” We customize Rogers’ definition to B2B e-marketplaces and define relative advantage as the degree a B2B e-marketplace’s value propositions fill industry and organization needs or improve existing industry and organization operations. Each B2B e-marketplace in the study had buyer and seller value propositions. However, two of the marketplaces achieved high membership and two did not. In examining relative advantage, whether the marketplace offers a substantial, currently realizable, relative advantage to “in-power” organizations affects B2B e-marketplace membership. If value propositions are substantial to organizations “in-power” and currently realizable, these organizations encourage their business partners to participate and do business with them over the B2B e-marketplace.

In the transportation industry, large volume shippers have influence over carriers because they represent significant revenue. NTX offers shipping organizations substantial savings and more efficient operations by providing means to electronically tender freight using the Internet. Since shipping organizations saw the value proposition’s benefits, they decided to participate in NTX. These organizations encouraged and required their carriers to participate. This is illustrated in the excerpt below.

When NTX went to Toshiba to do business with them, we got Toshiba and their carriers for the Toshiba business. But we also got the carriers for the marketplace.

A lot of the carriers on the marketplace were brought by customers.

---Regional Sales Director, NTX

Trying to improve procurement practices, twenty-one utilities formed Pegasus. Because utilities purchase many products and services, they represent substantial revenue to many suppliers, especially industry suppliers. The utilities were able to persuade the suppliers, that depended on the utilities' business, to consider membership. The utilities had difficulty persuading large suppliers with virtual monopolies or suppliers with which the utilities were not primary customers (e.g., computer suppliers) to join. The virtual monopoly suppliers already had most of the business and so Pegasus' increased reach value proposition was not substantial. Furthermore suppliers, with which the utilities were not primary customers, did not have a substantial incentive to participate since the utilities weren't a big part of their business.

Once the utilities had potential commitments from suppliers over which they had influence, they still struggled finalizing their membership. These suppliers did not join Pegasus until Pegasus' value propositions became realizable. These realizable value propositions involve actual transactions in which the utilities and participant suppliers could engage in via Pegasus. Examples of actual transactions include collaborations to reduce supply chain costs, reverse auctions, and requests for proposals. These transactions were normally preplanned using communication channels outside of the e-marketplace (e.g., face-to-face, telephone).

When CSX formed as a joint venture to improve convenience store industry operations, the marketplace's immediate realizable benefits were improving communication between the Gulf Coast Oil Corporation and the Gulf Coast Oil retail stores. While benefits accrue to both the Gulf Coast Oil Corporation and the Gulf Coast Oil retail stores, the benefits to the Gulf Coast Oil Corporation were substantial because they helped Gulf Coast Oil better control retail store operations. Since the Gulf Coast Oil retail stores each represent a small part of the Gulf Coast Oil Corporation, the Gulf Coast Oil Corporation had power over the stores and required the stores adopt the marketplace.

CSX's communication value proposition between large corporations and retail stores was immediately realizable. However, **industry retail competition**, and the fact

that the marketplace started within Gulf Coast Oil, probably were stronger inhibitors to competing retailers' adoption than the value propositions were as retailer membership drivers. In addition, CSX membership requires each retail store pay a per month/ per store fee. Many potential retail members did not see measurable benefits for the up-front fees.

In the convenience store industry, suppliers have power over retail convenience stores because suppliers are large corporations with many customers. Because convenience stores sell small product quantities, they do not typically represent a substantial part of a suppliers business. CSX's immediate value propositions help convenience stores obtain better information. CSX's long-term value propositions help suppliers and distributors obtain better information on retail store sales and communicate information to retail stores. These value propositions require changing industry practices to be realizable. When they become realizable, the improved information will not substantially increase supplier sales because of the small quantities convenience stores purchase. In some ways, the marketplace's value propositions could hurt particular suppliers' sales since the marketplace's aim is replacing some physical supplier contact with electronic contact. This point is illustrated in the excerpt below.

We worked for 2 years to get Pepsi in the marketplace. And I got to meet with the ranking lady at Pepsi. You know what she told me? She said, "Karen we don't want to be part of the marketplace; there is no advantage to us. We want our people in the stores. If our people are in the stores they can set our product up and put our product in places where our competitor's product is. We want our people there." This is the way the whole industry operates.

---President and Chief Operating Officer, CSX

For distributors, negative effects accompany realization of CSX's distributor value proposition. Currently distributors control supplier-retailer information flow. CSX's value proposition improves supplier-retailer communication, taking some of the distributor's power away. Operationally, improved communication allows retailers to learn about and request new products. This causes distributors to have to stock the



products. Distributors prefer to carry fewer products as carrying additional products increases distribution costs. This idea is illustrated in the excerpt below.

Having the retailers know about these things like green Pringles makes them want to order them and makes the distributor have to carry them. This is more work for the distributor.

---Senior Vice President of Strategic Alliances,  
United States Convenience Store Association

Given the negative effects of CSX's distributor value proposition, why did McMurray Distributing encourage their biggest customer, Momentum Manufacturing, to join? The field notes indicate that initially McMurray Distributing did not fully examine the potential impacts of CSX's value propositions. McMurray Distributing's desire to win the Gulf Coast Oil contract and the electronic commerce (EC) hype were stronger membership drivers than CSX's value propositions. Winning the Gulf Coast Oil contract made all 3,500 Gulf Coast Oil convenience stores McMurray Distributing's customers for the next three years. With the Gulf Coast Oil contract in hand and the burst dot.com bubble, the desire to encourage others to join and the desire to continue membership lessened.

Retail Matrix's value propositions focus on improving convenience store industry operations. This includes improving supplier-retailer information flow and helping retailers come together to negotiate better supplier pricing. Individually, retailers have no leverage with suppliers because they represent such a small portion of a supplier's business. In the industry, the suppliers have the power and the money. Retail Matrix could not influence suppliers to join because the value propositions did not represent substantial value to suppliers since convenience stores are such a small portion of supplier business. The excerpt below illustrates this.

The manufacturers were used to defining the terms of the playing field and the marketplace would shift that power.

--Senior Vice President of Strategic Alliances  
United States Convenience Store Association

Many studies link perceived relative advantage to system adoption (Chwelos et al. 2001, Iacovou et al. 1995, Lee and Clark 1996b, O'Callaghan et al. 1992). This study indicates perceived relative advantage is not enough to achieve marketplace membership. B2B e-marketplace membership hinges on relative advantage being immediately realizable to “in-power” organizations. If these conditions are present, “in-power” parties will join the marketplace and then encourage their business partners’ membership.

Relative advantage as a B2B e-marketplace membership driver is in line with previous IOIS research. Three electronic data interchange (EDI) studies (Chwelos et al. 2001, Iacovou et al. 1995, O'Callaghan et al. 1992) link relative advantage and EDI adoption. Two EDI studies (Premkumar et al. 1994, Ramamurthy et al. 1999) link relative advantage and EDI diffusion. In B2B e-marketplace contexts, Lee and Clark (1996b) link increased efficiency and effectiveness to B2B e-marketplace adoption. Lee and Clark also explain that firms adversely affected by electronic markets will resist implementation. This is in line with our finding that the marketplace must offer the “in-power” organizations a relative advantage. Grewal et al. (2001) link B2B e-marketplace adoption fueled by efficiency motivations to marketplace use.

Previous interorganizational information systems (IOIS) research has not qualified relative advantage. This is the first study where **current realizability** of relative advantage has surfaced. This may be because previous IOIS were operational when organizations were soliciting participation. Therefore it was assumed that the relative advantage was realizable. However, many B2B e-marketplaces solicited membership before the marketplace was operational. The data contrasts currently realizable vs. non-realizable relative advantage. We therefore posit that realizable relative advantage drives B2B e-marketplace membership.

Several EDI studies (Chwelos et al. 2001, Crook and Kumar 1998, Iacovou et al. 1995, Premkumar and Ramamurthy 1995) corroborate our finding that powerful companies encourage their less powerful trading partners to join B2B e-marketplaces. However, the study is the first in a B2B e-marketplace context recognizing that business partner encouragement drives B2B e-marketplace membership. In addition, previous IOIS studies do not recognize that for business partner encouragement to occur, relative advantage must be currently realizable to “in-power” organizations.

#### 7.1.2. Business Environment Change

Viewing B2B e-marketplaces as a mechanism for dealing with business environment changes drives organizations to join B2B e-marketplaces. The “dot.com” boom and bust illustrates this. In the late 1990s corporate America discovered the Internet and became enamored with Internet applications improving business practices. Wall Street was rewarding Internet initiatives despite underachievement in traditional performance metrics (e.g., profit) and was penalizing traditional companies without EC strategies. Three of the four B2B e-marketplaces formed during the height of the EC boom--2000. All four marketplaces cited the need to use EC in order to stay abreast of current business trends as a marketplace membership driver. The quotes below illustrate this point.

The mentality before NTX took stock of the need for hiring people that knew the marketplace from the ground level was that B2B was growing so fast that these organizations had to join it to get in the game.

---Regional Sales Director, NTX

The precursor to all of these utilities joining the marketplace is that the marketplace formed in the midst of the “dot.com” buzz. All of the analysts were saying, “You need to get into e-commerce”.

---President and Chief Executive Officer, Pegasus

They believed in the potential of the Internet and felt they needed to reinvent themselves.

---President and Chief Operating Officer, CSX

Since the study began during the early stages of the EC boom, endured the bust, and continued through stabilization, we saw how business environment changes affect membership. When the environment changed and Wall Street was no longer pushing EC, organizations were no longer dealing with the need to do EC. As such, marketplace membership, which had been viewed as a mechanism for dealing with the environment change towards EC lessened. The quotes below illustrate this point.

Most people were thinking of joining in late 2000, in the new year of 2001 when there started being “dot.com” failures, the people who were planning on joining weren't as keen on it.

--- Senior Vice President of Strategic Alliances,  
United States Convenience Store Association

In January 2001, the Internet bubble burst. When I met with Earl originally (Earl is the Chief Executive Officer of McMurray Distributing), we had dinner together and here's what he told me. This is a quote, “I don't know what my business is going to look like in the next few years but I know it is going to be fundamentally different.” This was in the midst of the Internet and during the “dot.com” boom. When the bubble burst, he moved from a proactive industry leader approach to an option approach, with the idea of we invested in this marketplace but let's just hold it and see what happens.

---President and Chief Operating Officer, CSX

Really, we were in the right place at the right time. It was right in the middle of all of the “dot.com” hype and organizations wanted to form marketplaces. Now no one is forming marketplaces.

--President and Chief Executive Officer, Pegasus

Given that each marketplace recognized that organizations joined their marketplace because they viewed marketplace membership as a mechanism for dealing with the environment change toward electronic business, why did two marketplaces achieve high membership and two not? Two of the marketplaces were in industries that saw the marketplaces as a mechanism for dealing with other business environment changes. After the “dot.com” bust, utilities were still facing industry deregulation and saw Pegasus as a way to deal with deregulation.

The utilities were faced with deregulation and they knew they needed to do something about it.

--President and Chief Executive Officer, Pegasus

Since NTX started in 1995 they had a base of business to sustain them through the “dot.com” bust. After September 11, 2001 shippers saw NTX as a mechanism for dealing with freight shortages. Post September 11, companies contracted and pulled excess freight off the road. For shippers freight became difficult to find, so shippers started using NTX to find trucks. Freight prices skyrocketed and carriers in long-term contracts could obtain much better rates on NTX. Excess freight was what NTX thought was their biggest strength, but freight shortages were their biggest strength. The following quote illustrates this.

To date, we've tried a number of ways to get success. On 9/11 when capacity dried up we started going crazy with people joining to find freight. We are still growing and we have funding for 2 more years.

--Regional Sales Director, NTX

The existing IOIS research supports our finding that organizations join B2B e-marketplaces when they view the marketplace as a mechanism for dealing with a business environment change. Many IOIS studies (Cavaye and Cragg 1995, Damsgaard and Lyytinen 1998, Ramamurthy et al. 1999, Reich and Benbasat 1990) link organizational IOIS adoption to competitor IOIS adoption. We include these studies as support for our finding because they discuss industry leaders implementing IOIS. Industry leader IOIS implementation causes the environment to change. This in turn leads other organizations to implement similar IOIS because they think they have to keep pace with the changing environment and the industry leaders.

Customer-oriented strategic systems (COSS) (Cavaye and Cragg 1995, Reich and Benbasat 1990) studies link competitive pressure to COSS development. EDI studies (Damsgaard and Lyytinen 1998, Iacovou et al. 1995, Premkumar et al. 1997, Ramamurthy et al. 1999) link competitive pressure to EDI adoption. Grewal et al.'s (2001) survey of B2B e-marketplace members finds that some organizations join e-marketplaces because everyone else is and because the organizations think they should in order to gain legitimacy.

The finding that viewing the e-marketplace as a mechanism for dealing with a business environment change drives e-marketplace membership is similar to our original proposition that business environment encouragement drives e-marketplace membership. In addition, organizations using the B2B e-marketplace can cause the business environment to change. This can lead to other organizations viewing joining the e-marketplace as a mechanism for dealing with the change.

## **7.2. FACILITATING DRIVERS**

### **7.2.1. Communication**

Communication is a facilitating driver of B2B e-marketplace membership. The model defines communication as making intended members aware of the B2B EC marketplace, its value propositions, and its membership criteria. The paragraphs below discuss B2B e-marketplace communication drivers.

#### 7.2.1.1. Marketing and Promotion

The model defines system marketing and promotion as making target organizations aware of the B2B e-marketplace and aware that the marketplace would like these organizations to participate in the marketplace. Our data indicate who is doing the marketing and promotion and how it occurs affects B2B e-marketplace membership.

NTX, CSX, and Retail Matrix all did considerable marketing and promotion in terms of trade shows, media tours, conferences, and press releases. Pegasus did not. Pegasus, CSX, and Retail Matrix indicate this type of marketing and promotion does not affect membership. NTX's data indicate a high marketing and promotion level and a strong effect on membership. CSX and Retail Matrix paid the most attention to this type of marketing and promotion and were least effective in gaining membership. Based on these results, system marketing and promotion does not seem to have a strong effect on B2B e-marketplace membership. This is contrary to much of the IOIS work (Cavaye and Cragg 1995, Hope et al. 2001, Iacovou et al. 1995, Reich and Benbasat 1990, Runge 1985, Runge 1988), which links systems marketing and promotion to IOIS adoption.

Looking deeper into marketing and promotion, we found who is doing the marketing and promotion is important. All of our marketplaces have **sales representatives** from the **industry**. However, NTX originally did not. In the excerpt below, NTX's Regional Sales Director explains the importance of sales people with industry experience.

A few years ago, NTX decided that if they were going to go anywhere they needed to hire people with a knowledge of transportation at the street level. Hiring people that were already in the transportation industry and getting them to go out and present the idea to the customers was better. Street level people don't overpower the potential customers with language. They don't come up with a solution and say here use it. They work with the customer to educate them on the technology.

The type of marketing and promotion is important. NTX's marketing and promotion consists of training sessions on how to start using NTX. Originally, Pegasus' marketing and promotion was at a visionary level, explaining how the marketplace

would work in theory. With this approach, utilities had difficulty using Pegasus. Pegasus and member utilities had difficulty influencing suppliers to join. Later, Pegasus had buyer development managers help utilities and suppliers execute agreements and do business over the marketplace. When Pegasus started doing this, suppliers started participating. Retail Matrix's and CSX's marketing and promotion focused on presenting the vision of how the marketplace would work at trade shows, media tours, conferences, press releases, and site visits. Neither Retail Matrix's nor CSX's marketing and promotion included **education** on how to use the marketplace. Marketing and promotion that includes education on how to use the marketplace drives B2B e-marketplace membership.

The existing IOIS literature does not link industry sales representatives and educating potential members on how to use the IOIS to IOIS adoption.

#### 7.2.1.2. Relationships

Relationships facilitate and inhibit communication, and ultimately e-marketplace membership. We define relationships as knowing people within the organizations the marketplace is intended to serve. Relationships provide a means for communicating the marketplace. However, the desire to maintain relationships makes industry players reluctant to join marketplaces. Industry players fear B2B e-marketplaces will replace their personal relationships based on trust and noncontractible services with electronic relationships based on price alone. In this sense, relationships hurt marketplace membership.

Relationships as a facilitator of communication, and ultimately marketplace **membership**, are evident in each of our four marketplaces.

Venture capitalists formed NTX. For several years NTX went nowhere as they needed a means of communicating their marketplace to the industry. NTX's membership increased as a result of hiring sales people from the transportation industry. These people had industry relationships, which gave them entrée to communicate the marketplace to potential member organizations.



Pegasus' Chief Executive Officer was a consultant helping six of the founding Pegasus' utilities deal with supply chain issues. He had strong relationships with executive management at all six utilities. Having a history of regulation, utilities know one another and have a history of sharing information and working together to solve problems. Relationships facilitated communicating Pegasus to executive management of the six founding utilities. Relationships enabled the founding utilities to communicate Pegasus to the remaining industry utilities. The utilities then organized a meeting discussing Pegasus.

The convenience store industry is very competitive. As such, relationships form along supply chains. Retailers have strong relationships with their distributors and distributors have strong relationships with manufacturers. Competitors do not develop close relationships. Retailers do not form relationships with most manufacturers because they purchase most products through distributors. When Gulf Coast Oil decided to form a convenience store industry marketplace they needed an organization with strong industry relationships to help communicate the marketplace to the industry. Gulf Coast Oil encouraged their distributor to help form the marketplace. Having an industry distributor with well-developed industry relationships enabled CSX to communicate the marketplace to potential members.

CSX became a separate company from Gulf Coast Oil in an effort to increase retailer membership. Unfortunately, retailers still recognized the initial Gulf Coast Oil relationship and were skeptical about joining a competitor-formed marketplace. The Gulf Coast Oil separation caused CSX's Gulf Coast Oil relationship to weaken. CSX's relationship with Gulf Coast Oil further deteriorated when Gulf Coast Oil replaced their original CSX board member, who represented the internal Gulf Coast Oil group CSX serviced, with a Gulf Coast Oil executive from another Gulf Coast Oil group that was not involved with CSX.

The convenience store industry trade organization formed Retail Matrix. The United States Convenience Store Association has relationships with most industry retailers, distributors, and manufacturers. These relationships gave Retail Matrix a

means of communicating the marketplace to the industry. As the trade organization, Retail Matrix does not buy or sell anything. Because of an array of reasons, Retail Matrix was unable to influence any organization that conducted convenience store industry transactions to join. This hurt their ability to influence other organizations to join.

While relationships facilitate communication about the marketplace and ultimately marketplace membership, potential members' desire to **maintain existing relationships** inhibits organizations' marketplace membership. In both NTX and Pegasus, suppliers told buyers that marketplace membership would hurt their relationship. Suppliers explained that they provide many value-added services to their customers and that marketplaces focus primarily on price.

Relationships did not discriminate between high membership marketplaces and low membership marketplaces. All four marketplaces use relationships to facilitate marketplace promotion. The two high membership marketplaces repeatedly mention participants' desire to maintain industry relationships as a membership inhibitor. The two low membership marketplaces did not mention this. This is counter intuitive, but may be because the two low membership marketplaces didn't make it this far. In addition, the two high membership marketplaces **adapted to support existing industry relationships**. NTX modified their software to enable shippers to procure freight from their existing carriers. Pegasus realized utilities want to use the marketplace to facilitate procurement from existing suppliers with prenegotiated contracts rather than seeing the entire population of suppliers and products. Pegasus modified their marketplace to support this.

The existing IOIS literature does not mention relationships between industry organizations and between the people in these organizations as an IOIS adoption facilitator. We conjecture that this is due to the following fact. Previous IOIS were formed within industry organizations. These organizations had existing and ongoing relationships with their trading partners. Therefore, the "existing industry relationship" was not a factor in previous studies.

#### 7.2.1.3. Industry Competition

The marketplace membership process section explains some organizations participate in B2B e-marketplaces because their competitors are and they feel they have to participate to remain competitive. Competitive environment as an adoption facilitator is documented in the IOIS literature. However, the field data indicate competition works another way. Comparing competition within the industries the four marketplaces represent, shows competition affects relationships, which in turn affect communication. The more intense industry competition is, the less likely industry organizations are to have relationships with one another, and thus participate in the same marketplace as their competitors. The less competitive the industry, the more likely organizations are to have relationships with and join the same marketplace as their competitors facilitating an industry marketplace. The case studies illustrate this.

Until the past few years, utilities were regulated. They did not compete with one another. Since the utilities did not compete, they had relationships and a long history of sharing ideas. Utilities had no problem participating in a marketplace their competitors were in because they had never competed with these companies. Within two weeks of Pegasus' formation, most North American utilities were participating in the marketplace.

In the convenience store industry, intense competition exists at each level of the supply chain. In the EC heyday, competitor marketplace membership drove other industry players to consider marketplace membership. However, industry players were hesitant to participate in the same marketplace as their competitors, undermining the vision of a convenience store industry B2B e-marketplace. Part of the problem was that industry participants did not have relationships with their competitors. In the EC heyday, two convenience store industry marketplaces formed. Each had potential participants along a supply chain (e.g., retailer, distributor, manufacturer). This situation hurt both marketplaces' membership solicitation efforts because potential members: did not want to be in a marketplace with their competitors, did not want to invest in both, and wanted to wait and see which one would become the convenience store industry B2B e-marketplace.

One solution to getting the industry to come together and form a marketplace is having the industry trade organization found a marketplace. The United States Convenience Store Association had relationships with all the retailers, distributors, and manufacturers. Unfortunately, even with the trade organization's ability to bring the industry together, competition controlled potential members' thinking. They did not want an open marketplace in which all organizations were equal. They insisted on tiers and preferential treatment for industry players with more money. The trade organization had to incorporate all these views in shaping their marketplace since they depend on the industry for existence. As such, Retail Matrix's envisioned marketplace was no longer open. In this sense, Retail Matrix became like CSX. Several months before, Retail Matrix would not endorse CSX because their marketplace was not open. Then, after the industries' input, Retail Matrix's envisioned marketplace was not open either. The following quote illustrates competition in the convenience store industry.

In the case of the marketplace for the industry, we were working with organizations that try desperately to differentiate themselves. They could never get over trying to get a bigger piece of the pie and understand that we are going to make a bigger pie.

---President and Chief Operating Officer, CSX

We ultimately decided not to be a part of it (CSX) because it was never going to be open. For us to join a marketplace it had to be an open marketplace and theirs was never going to be open.

Being a trade organization we wanted to restrict everyone so they had the same level of participation. They all paid a price and it was egalitarian. With them being naturally competitive they didn't want that. They wanted different levels of participation based on what they pay. It goes to the issue of control, power, and influence. So, we did a compromise and structured the marketplace so they could have different levels of participation.

--- Senior Vice President of Strategic Alliances,  
United States Convenience Store Association

Why did NTX achieve high membership when the transportation industry is also competitive? NTX overcame carrier competition as a membership inhibitor by having an **independent ownership structure** and being buyer driven. Venture capitalists forming NTX facilitated membership as it overcame the problem of potential participants not wanting to participate in a competitor-formed marketplace. This is in line with Memishi's work (2001), which proposes marketplace success is contingent on the founding companies distancing themselves as organizations will be hesitant to participate in competitor-operated marketplaces. Also, NTX membership is shipper driven. Shippers represent an array of industries. The carrier side is the competitive side not the shipper side.

Competition works both ways. Competition can be the impetus for organizations participating in a marketplace as we saw in the "environment change" section. However competition can also prevent the formation of truly open industry marketplaces. Competitive organizations have no relationship on which to build a marketplace and do not want to participate in a marketplace with one another. Competition was one of the main marketplace membership inhibitors in the convenience store industry.

The existing IOIS literature does not mention competition's effect on relationships. This may be because existing IOIS were implemented between an organization and its trading partners and did not focus on bringing competitors together.

#### 7.2.2. Continued Existence

Change takes time. Even if a marketplace offers relative advantage to "in-power" players and the environment encourages marketplace membership, attracting members takes time. Therefore, the model proposes continued existence drives marketplace membership.

How do marketplaces achieve continued existence? The data indicate marketplaces providing complementary services to potential participants can achieve continued existence. Complementary services provide a revenue stream until the marketplace is up and going. They also build relationships with the marketplaces and

move the organizations in a direction culminating in marketplace use. The cases below provide an illustration.

NTX started as a pure marketplace with the vision of matching buyers and sellers of excess freight. They struggled for several years to achieve membership. Shippers needed a way to automate their existing freight procurement processes. NTX adapted by letting shippers use their software as a means to electronically facilitate existing freight agreements. This allowed NTX to sustain themselves until the marketplace took off. In addition to a revenue stream sustaining NTX's existence, this move got shippers using NTX's technology and using the marketplace to procure loads without existing carrier agreements. Shippers requiring their carriers' participation got carriers used to the technology and made their capacity available to other shippers. The following quote illustrates this.

We still do pure marketplace transactions but we had to move to this electronic facilitation of existing agreements while we got the marketplace up and running.

---Regional Sales Director, NTX

Pegasus had the same situation. They started as a marketplace for the utilities to conduct business. When the marketplace's technology was not as efficient as the utilities' existing technologies and the utilities struggled to change their existing business practices to incorporate the marketplace, Pegasus developed complementary services to stay afloat and to move the industry in the direction of marketplace use. The quotes below illustrate the importance of continued existence.

Getting up and going has still been like trench warfare.

---President and Chief Executive Officer, Pegasus

During the “dot.com” craze everyone thought you had to be the first to market. Being the first to market is not the key, hanging in there for another day is the strategy. Pegasus has been successful because we have a multi-faceted business model. Enough has worked to give us continued existence.

---Sales Vice President, Pegasus

CSX also struggled to attract members. To sustain until the industry adopted the marketplace, CSX became a software company. They sold their extranet software to one retailer. Adopting the extranet software moved the one retailer in the direction of marketplace use. However, this was not enough to sustain them.

Retail Matrix did not have the funds to support an alternative strategy while their marketplace struggled to attract members.

The IOIS literature does not mention that continued existence drives IOIS adoption or membership. The IOIS literature also does not mention the importance of offering complementary services in order to continue to exist and move organizations toward e-marketplace membership and use. This is probably because previous IOIS were hatched and supported within organizations. Continued existence is critical to B2B e-marketplace membership because marketplaces must sustain in order to attract members. Complementary services provide financial resources to sustain the e-marketplace until a critical mass of organizations join and begin using the marketplace.

### **7.3. CONCLUSION**

This chapter posits a model explaining several factors driving B2B e-marketplace membership. See Figure 10. The revised model is based on extensive fieldwork and intensive field note coding. The revised model is the result of cross-case driver and membership level comparisons between the four marketplaces and between the two high membership (NTX and Pegasus) and the two low membership (CSX and Retail Matrix) marketplaces.

### 7.3.1. Comparison to Original Model

Some drivers in the original model, Figure 4, are not present in the revised model. Some drivers are present in an underlying dimension of the revised model.

The original model posits **external pressure** consisting of **business environment encouragement** and **business partner encouragement** drives B2B e-marketplace membership. The revised model includes business environment encouragement as part of the business environment change discussion. The revised model posits that if the marketplace offers a currently realizable relative advantage to “in-power” organizations, they will then **encourage** their business partner to join.

The original model posits **key player involvement** drives B2B e-marketplace membership. We define key players as organizations having more sales than most other industry organizations or as organizations with few competitors in either production or consumption of industry goods. The revised model does not have key player involvement as a direct B2B e-marketplace membership driver. However, key player involvement surfaces in the relative advantage discussion. In discussing relative advantage, the model explains marketplace membership hinges on offering organizations “in-power” a relative advantage. The model further explains, given currently realizable relative advantage to “in-power” organizations, they will join the marketplace and encourage their trading partners’ membership.

The original model posits **industry support** drives B2B e-marketplace membership. The model operationalizes industry support as trade organization support. The data did not show a link between industry support and marketplace membership. Retail Matrix, formed by a trade organization, had the fewest participants. NTX had the most participants. NTX did not have trade organization support and explain that the trade organization fears them and wants them to go out of business. Trade organization support was not critical to Pegasus. In the interview, the Buyer Development Manager was unsure whether Pegasus had trade organization support. CSX tried to merge with Retail Matrix because they thought trade organization support drove marketplace membership. When we asked CSX’s President and Chief Operating Officer about the



importance of trade organization support to organization marketplace membership, she explained that the industry which the trade organization represented did not want the trade organization participating in a for profit venture. She was also quick to point out that the marketplace with trade organization support was the first to fold.

### 7.3.2. Research Implications

This chapter's findings offer insights to the existing IOIS literature as well as to a number of theories underpinning this literature. In this section, we discuss the IOIS literature implications as well as the theoretical implications of our study.

#### 7.3.2.1. Interorganizational Information Systems (IOIS) Literature Implications

As we discussed each of our study's findings in the chapter, we compared each finding with the existing IOIS literature. In the comparison, we recognized and cited other IOIS studies which agree with the particular individual findings in our study. Our literature comparison expanded to the IOIS literature, because very little e-marketplace research exists.

Our study is one of the first to recognize three IOIS adoption motivations. The existing IOIS studies typically link one of the motivations in our findings to IOIS adoption. A few studies (Chwelos et al. 2001, Crook and Kumar 1998, Grewal et al. 2001, Iacovou et al. 1995, Ramamurthy et al. 1999, Williams 1994) link two of the motivations in our study to IOIS adoption. Only one study (Premkumar and Ramamurthy 1995) recognizes three motivational drivers for IOIS adoption. This study is a survey in an EDI context.

The existing IOIS literature's lack of recognition of multiple IOIS adoption motivations may be because the literature that formed most of the previous IOIS research involved soliciting information based on previous findings and preexisting theoretical frameworks. Because our research was grounded in the experiences of e-marketplace makers and organizations implementing e-marketplaces, we were able to uncover an array of motivations for e-marketplace membership.

In addition, our research recognizes both motivating and facilitating drivers of e-marketplace membership.

The existing IOIS literature does not mention continued existence as a facilitator of IOIS adoption. Nor does the literature mention the need to offer complementary services in order to survive. Most IOIS were formed and supported within organizations. The group implementing the IOIS could depend on their organization's resources for survival. The group could also depend on the relationship between the implementing organization and its trading partner in order to achieve IOIS adoption and use.

Most e-marketplaces and the e-marketplaces in this study are stand-alone ventures. As a result, these e-marketplaces do not have the same organizational resource support that IOIS created within and protected by organizations have. As such, the e-marketplace's continued existence is critical to achieving membership. The e-marketplace has to survive in order for organizations to become members. Offering complementary services is critical to an e-marketplace's continued existence. Complementary services give the e-marketplace a way to exist, while organizations consider joining and move toward using the e-marketplace. Complementary services move some organizations toward using some e-marketplace offerings and to influencing their trading partners to join and use the e-marketplace.

The IOIS literature does not recognize that communication facilitates IOIS adoption. This may be because most IOIS connect an organization to its trading partners. As such, learning about the IOIS only requires the initiating organization communicate with the trading partners they want to do business with over the IOIS. E-marketplaces require the membership and use of a critical mass of buyers and sellers. As such, soliciting this critical mass of members requires communication to all the intended participants.

The IOIS literature links marketing and promotion to IOIS adoption (Cavaye and Cragg 1995, Hope et al. 2001, Iacovou et al. 1995, Reich and Benbasat 1990, Runge 1985, Runge 1988). The two e-marketplaces in our study that did the most traditional marketing and promotion were the least successful in attracting members. However, our study indicated two aspects of marketing and promotion facilitate e-marketplace

membership: having industry sales representatives and having these sales representatives educate organizations on how to use the e-marketplace. The existing IOIS literature does not recognize the importance of industry sales representatives. Again, this may be because the other IOIS were formed within industry organizations. As such, people from the initiating organization had industry experience and industry relationships. The dynamics behind previous IOIS implementation may not have provided a comparison between people with industry experience and relationships and those without.

Finally, the existing IOIS literature does not mention competition's effect on IOIS relationships. This is probably because previous IOIS studies focus on linking an organization and its trading partners. They do not focus on bringing entire industries, including competitors, together to do business.

#### 7.3.2.2. Theoretical Implications

In addition to providing implications to the existing IOIS literature, this study also provides implications to a number of theories underpinning the existing IOIS literature.

**Innovation diffusion theory** (Rogers 1995) posits users' technology adoption decisions as rational choices based on technology characteristics. The theory posits users adopt technology they perceive offers greater: relative advantage, compatibility, trialability, observability, and less complexity. Rogers (1995, p. 213) defines relative advantage as "the degree an innovation is perceived as being better than the idea it supersedes." This study's findings support innovation diffusion theory by proposing relative advantage in terms of a marketplace's value proposition drives marketplace membership.

This study's findings qualify relative advantage, explaining that the e-marketplace must provide a relative advantage to "in-power" organizations. While innovation diffusion theory does not make this qualification, Lee and Clark's (1996b) e-marketplace study supports the "in-power" relative advantage qualification. The authors find lack of market power to enforce the change is a barrier toward

e-marketplace adoption. Lee and Clark explain that firms adversely affected by an electronic market will resist and oppose the system. CATS, one of the failed e-marketplaces in their study, lacked the market power to persuade industry organizations to use the e-marketplace.

Innovation diffusion theory does not specify that relative advantage must be currently realizable. This may be because the innovations used to develop innovation diffusion theory were functional. The innovations were actual systems that could be used. This study included several e-marketplaces that were at some point not functional. These innovations were ideas and presentations, not actually usable systems. This allowed the study to contrast currently realizable vs. anticipated relative advantage.

Malone et al.'s (1987) **electronic markets hypothesis** posits that buyers and suppliers have different motives for joining electronic markets. Suppliers join electronic markets because they want buyers to purchase their products rather than their competitors. Buyers join electronic markets to increase the number of alternative suppliers and better compare prices. This research supports and contradicts the electronic markets hypothesis. We found one supplier that joined the e-marketplace because they wanted buyers to purchase their products instead of their competitors' products. The other suppliers in our study joined the e-marketplace because their trading partner encouraged them to join. The suppliers joined because they wanted to retain their existing business relationships. In fact, once members of the e-marketplace these suppliers used the e-marketplace to do business only with the business partner that encouraged them join. The suppliers did not venture into making their products available to other e-marketplace buyers.

The findings offer several contrasts to the electronic markets hypothesis. Many of the buying organizations in the study joined e-marketplaces because they felt they had to in order to stay abreast of the business environment push toward EC involvement. This is not mentioned in the electronic markets hypothesis. In addition, one of the e-marketplaces in the study, NTX, changed the market structure and allowed sellers to compare prices and alternatives, but did not allow buyers to electronically compare

prices or alternatives. The electronic markets hypothesis predicts that buyers will use e-marketplaces to compare prices.

**Power theories** (Emerson 1962, Pfeffer 1988, Pfeffer and Salancik 1978, Thompson 1967) explain organizations depend on other organizations to the extent that an organization needs resources or performances from the other organizations, and in inverse proportion to the extent that others can provide the same resource or performance. An implication of power theory is that powerful organizations can influence activities of organizations that depend on them. This supports the business partner encouragement discussion in the research model. The research model posits that there must be a relative advantage to “in-power” organizations, as these organizations will then encourage their less powerful trading partners to participate in the marketplace. The less powerful trading partners will participate because they depend on their powerful trading partners.

The data indicate that power may be a stronger explanation for e-marketplace membership than relative advantage. Two selling organizations explained that they joined the e-marketplace because of business partner encouragement. Both of these organizations stated that they did not perceive a relative advantage from e-marketplace membership.

The study finds that buyers’ and suppliers’ desire to maintain their existing relationships hinder marketplace membership. This finding supports **incomplete contracts theory**. Incomplete contracts theory (Hart and Moore 1990) posits that certain things such as supplier innovativeness are observed by parties in relationships, but are not verifiable by third parties (e.g., courts or arbitrators). These things cannot be contracted for ahead of time, but must be bargained for later. The buying organizations in our study recognized that their existing suppliers provided many value-added services that could not be contracted for through an e-marketplace. The buying organizations did not want to compromise the supplier relationships that they had worked for years to develop. Furthermore, selling organizations were reluctant to join marketplaces because the current marketplace models evaluated them on price alone and did not recognize the

many value-added services they provide to their customers. Marketplace membership increased when marketplaces customized their offerings to support these existing buyer-seller relationships.

**Institutional theory** (DiMaggio and Powell 1983, Meyer and Rowan 1977) suggests organizations adopt rules and practices that may not necessarily increase technical efficiency, but increase legitimacy in external stakeholders' eyes. The model's business environment change section supports institutional theory. The findings indicate that the "dot.com" boom and the fact that everyone was getting involved in e-business accounted partially for organizations joining B2B e-marketplaces. The data further illustrate this point with the difficulty in attracting marketplace members once marketplaces went out of fashion.

The discussion above shows that in some cases the existing literature and theories support our findings. These situations increase our findings' validity and extend the IOIS literature and theories to a different context, B2B e-marketplaces. In other situations, our findings conflict with the existing literature and theories. This section identifies and examines these situations, offering greater insight both to our study's findings and the existing literature and theories.

### 7.3.3. Practical Implications

Organizations forming a B2B e-marketplace should consider these findings. First, consider the industry the marketplace represents and which organizations have power. Make sure the marketplace offers these organizations value propositions. If the marketplace does offer these organizations value propositions and the propositions are currently realizable, they have a greater likelihood of joining and encouraging their trading partners' membership. When "in-power" organizations' trading partners join and use the marketplace, the business environment changes and other organizations recognize the importance of doing business over the marketplace.

While perceiving the marketplace as a mechanism for dealing with a business environment change drives marketplace membership, make sure EC involvement is not the primary motivation for e-marketplace involvement. If it is, when the environment

changes the other way, organizations will lose interest and others will not want to participate.

Achieving enough marketplace membership and use for the marketplace to reach financial sustainability takes time. Marketplaces must have another way to financially sustain while this is happening, preferably offering services complementary to marketplace use. NTX and Pegasus both offered services that sustained their marketplaces, while leading their industries slowly to marketplace use.

Obtaining entrée to potential participants to tell them about marketplace benefits is difficult. Marketplaces need promoters with industry relationships. Relationships help promoters obtain entrée to tell potential participants about the marketplace. Once in, the best approach is education, showing potential participants how to use the marketplace and the benefits. Often organizations would like to adopt a marketplace to improve business practices, but they don't know how to change their business practices to do so. Pegasus' Buyer Development Manager discusses the importance of education in achieving marketplace membership and use.

I can sit in a room and say I want to fly but unless I am given the tools I will not be able to fly.

Marketplaces must be aware of industry competition. In very competitive industries, competitors may not have cooperative relationships with one another. Relationships help communicate the marketplace's relative advantage and the marketplace as a mechanism for dealing with a business environment change. Without this foundation, establishing this communication is difficult. Even if communication can be established, strong competitors may not want to participate in a marketplace with one another.

This study also provides insights into qualifiers for and losers of marketplace membership. Qualifiers denote the minimum criteria necessary for a marketplace to attract members. This includes reasonable value propositions and continued existence. Value propositions that do never become realizable are marketplace membership losers.

“Vaporware” is a word that surfaced early in our field studies. Vaporware describes e-marketplaces that have an idea of how business will be conducted over the e-marketplace but no existing technology that allows idea execution.

#### 7.3.4. Future Research

This chapter is one of the first in-depth inquiries of B2B e-marketplace membership. While we answered a number of questions, a number still remain.

How does the model hold up with other B2B e-marketplaces? We develop a model of B2B e-marketplace membership drivers based on four marketplaces. The model is based on a theoretical sample with marketplaces with different membership levels, in different industries, and with different existence periods. However, the model will be stronger if compared to other marketplaces including other B2B e-marketplaces, consumer E-marketplaces, and non-electronic marketplaces.

How do competitors overcome competition and form an industry marketplace with all industry participants? The cases reveal competitive organizations do not have strong relationships, limiting their ability to establish communication soliciting marketplace membership. Even with communication, competitors cannot overcome distrust and participate in a B2B e-marketplace together. Action research or case studies of competitor-formed marketplaces will shed light on this question.

Public goods theory (Fulk et al. 1996, Monge et al. 1998) grapples with achieving collaborative action among self-interested organizations sharing a common goal. This chapter grapples with the same problem. Based on public goods theory, Monge et al. (1998) develop the theory of collective action in alliance-based interorganizational communication and information systems. Monge et al.’s theory describes the process of producing multi-firm, alliance-based interorganizational communication and information public goods. B2B e-marketplaces are examples of value chain alliances. Future theoretical insights can be obtained by exploring insights Monge et al.’s theory can provide to achieving B2B e-marketplace membership and insights this research can provide to Monge et al.’s theory.



## **CHAPTER VIII**

### **RESEARCH QUESTION 2: WHAT MARKETPLACE CHARACTERISTICS DRIVE BUSINESS-TO-BUSINESS ELECTRONIC MARKETPLACE USE?**

Chapter VII explores business-to-business (B2B) electronic marketplace (e-marketplace) membership drivers. It distinguishes membership as the decision to join a B2B e-marketplace and emphasizes that marketplace membership may not necessarily lead to marketplace use. This chapter and the following chapter explore marketplace use drivers. We define use as access frequency and transaction volume. This chapter examines marketplace characteristics driving marketplace use. Similar organizations with different use levels in the same marketplace form the impetus for Chapter IX. Chapter IX investigates organizational characteristics driving a particular organization's marketplace use.

For a marketplace to be used, there must be a significant number of members to do business over the marketplace and the marketplace's value propositions must be realizable. With these conditions in place, some marketplaces achieve high transaction volume and repeated use and others do not. What marketplace characteristics drive B2B e-marketplace use? To examine this question, we compare the four marketplaces' use levels. We also compare National Trucking Exchange (NTX) and Pegasus at their inception when they struggled to achieve use to most recently when their marketplaces have achieved higher utilizations. We then compare each marketplace's characteristics to determine that factors that distinguish high use from low use marketplaces. The field notes from marketplace and member organization interviews provide the basis of this comparison.

The paragraphs below discuss the model. The table supplements the discussion by evaluating the model's drivers. The conclusion discusses drivers in the original

model not included in the revised model, theoretical implications, practical implications, and future research avenues.

### **8. 1. RESEARCH MODEL**

Figure 11 shows marketplace characteristics driving B2B e-marketplace use. The model illustrates perceived realizable relative advantage drives marketplace use. We define perceived relative advantage as the marketplace's value propositions being better than the processes they replace. Whereas Chapter VII explains that organizations may join B2B e-marketplaces for an array of reasons, this chapter shows marketplace use will not occur without a perceived relative advantage. The model further posits that investor commitment and support drive perceived relative advantage and marketplace use. We define investor commitment as the founding organizations making efforts to use the marketplace and or providing the marketplace feedback to improve the marketplace's relative advantage so they can use the marketplace. We define support as working with member organizations to understand the marketplace's relative advantages, and ultimately use the marketplace. The two-sided between perceived relative advantage and marketplace use illustrates that the more a marketplace is used, the higher the marketplace's perceived relative advantage. Customizing to existing industry practices, supporting low-leverage procurements, fee structures, and benefits drive perceived relative advantage, which then drives marketplace use.

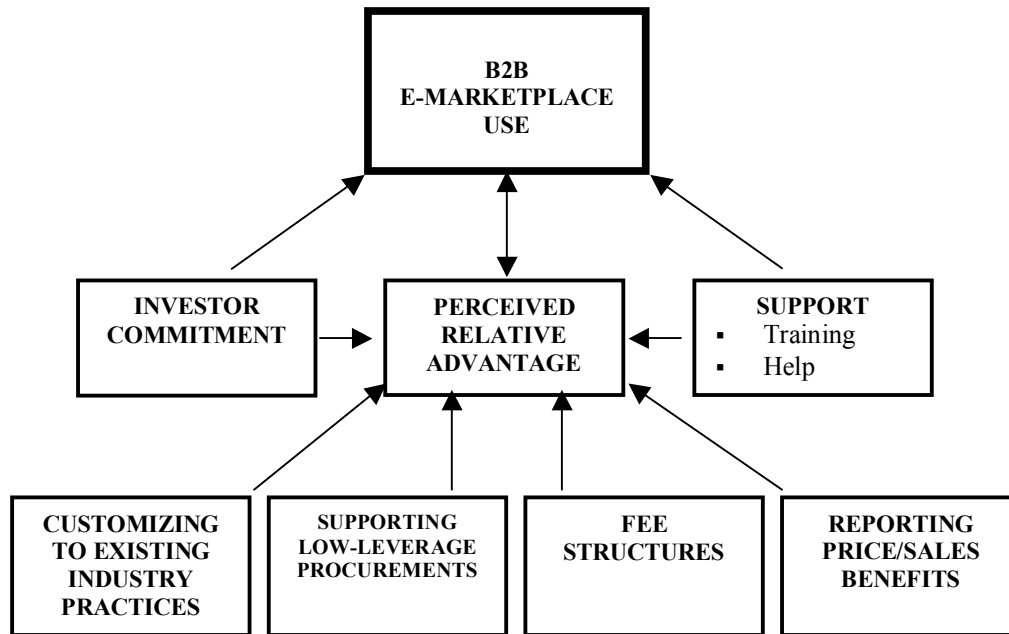
**Figure 11 Marketplace Characteristics Driving B2B E-marketplace Use**

Table 11 compares the four marketplaces' use levels and characteristics driving use. We measure use by the frequency and volume of transactions executed via the marketplace. Table 11 shows NTX has the highest use level, followed by Pegasus, C-Store Exchange (CSX), and Retail Matrix. We obtained use levels during field visits. Pegasus' and NTX's field visits occurred between May 21, 2002 and July 9, 2002. We verified NTX's and Pegasus' use levels with data published on their websites. While CSX's field visit occurred November 20, 2002, the use level was based on use prior to CSX's October 31, 2002 shut-down. Retail Matrix never achieved use.

**Table 11 Comparison of Marketplace Characteristics Driving B2B E-marketplace Use**

	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)	RETAIL MATRIX
USE	Over 10,000 transactions/day	Approximately 1,000 transactions/day	3,500 Gulf Coast Oil convenience stores use daily	0 transactions
USE DRIVERS				
PERCEIVED RELATIVE ADVANTAGE	Initially for shipments not covered by prenegotiated contracts, later as a facilitator for prenegotiated shipping contracts	None initially, later yes	Only by Gulf Coast Oil	Not applicable
Customizing to existing industry practices	Used to facilitate prenegotiated freight contracts	Used to negotiate supplier contracts and purchases from existing contracts	Tried	Not applicable
Supporting low-leverage procurements	Yes	Yes	Not applicable	Not applicable
Fee Structures	No membership fee, members are unaware of the amount of NTX's transaction fees	Membership fees, use fees, costs as a percentage of savings	Monthly membership fee and transaction fees	Not applicable
Reporting Price/Sales Benefits	Yes	Yes	Not applicable	Not applicable
INVESTOR COMMITMENT	Unavailable	Some utilities	No	Unavailable
SUPPORT	Yes	Yes	For retail stores	Not applicable

While we would like to compare transaction volume across all four marketplaces, Gulf Coast Oil Corporation only used CSX for communicating pricing and store operation information with 3,500 Gulf Coast Oil stores. We include Retail Matrix in the table. However, Retail Matrix's marketplace characteristic drivers do not add to this discussion, since Retail Matrix was unable to attract any members to conduct business over its marketplace before closing. As such, most of the cell entries for Retail Matrix are not applicable. Unavailable appears in a few of the table's cells. This indicates that

the field notes did not provide information for a particular driver in a particular marketplace.

#### 8.1.1. Perceived Relative Advantage

A B2B e-marketplace's perceived relative advantage drives marketplace use. The two-sided arrow connecting perceived relative advantage and use indicate that the more a marketplace is used, the greater the marketplace's perceived relative advantage. We define perceived relative advantage as a marketplace's offerings or value propositions "being better than the ideas they supersede" (Rogers 1995, p. 212).

Chapter VII finds that perceived relative advantage drives marketplace membership. Chapter VII finds perceiving the marketplace as a mechanism for dealing with an environment change also drives marketplace membership. Whereas organizations may join an e-marketplace for an array of reasons, they will not use the marketplace unless the marketplace offers a relative advantage. The paragraphs below discuss each marketplace's perceived relative advantage and how the marketplace's use increased its perceived relative advantage.

NTX brings together shippers and transportation carriers. NTX's relative advantage is transaction cost reduction. Posting loads on NTX's Internet website is more efficient than contacting carriers individually. In addition, pricing may be lower as carriers can increase capacity utilization by assimilating shipments into their routes and filling backhaul movements. In the transportation industry, companies frequently shipping to the same destination often have prenegotiated carrier contracts. Carriers strive to develop business in particular regions to optimize freight capacity. NTX offers a relative advantage in situations not covered by a preexisting arrangement. While this leads to some marketplace use, preexisting contracts cover most freight arrangements. As such, often shippers would post a load that was not picked up by a carrier or carriers would look for loads in an area and none would be available.

As discussed later, NTX modified their marketplace to facilitate preexisting carrier arrangements. With increased carrier and shipper marketplace utilization,

perceived relative advantage further increased. As with more organizations using the marketplace, the likelihood of tendering and finding relevant loads increased.

Pegasus opened for business January 2001. The participating utilities planned to transact all their procurement activities through Pegasus. The utilities believed transacting business over Pegasus would lead to lower prices due to electronic cataloging, facilitating easy supplier price comparisons, and streamlining existing procurement practices. Rather than doing business in a variety of ways (e.g., face-to-face, telephone, fax, e-mail, printed catalogues, electronic data interchange) all transactions would occur over the marketplace.

With Pegasus' initial release, the utilities realized that Pegasus' marketplace business practices did not offer a relative advantage. Whereas most North American utilities were Pegasus' members, few suppliers joined Pegasus. Furthermore, the participating suppliers did not list their lowest pricing with the marketplace. Several utilities had better contracts with their preexisting supplier arrangements. In addition, Pegasus' purchasing user interface was less efficient than the utilities' existing purchasing interfaces. For example, in utility industry operations, computer-aided-design and computer-aided-manufacturing applications are common. Engineers lay out new utility infrastructure with computer-aided-design and computer-aided-manufacturing programs. Once the design is complete, a materials list (e.g., poles, transformers, wires) is automatically created for later submission to preferred suppliers. Pegasus' initial user interface was a catalogue based business-to-consumer interface similar to Amazon.com. Pegasus' interface required utilities search online catalogues to procure products.

Even though the utilities' decision to participate in Pegasus was partly fueled by Pegasus' perceived relative advantage, Pegasus did not originally achieve use because the perceived advantage did not materialize. Pegasus' later offerings did provide members a perceived relative advantage. With these offerings, member use increased. With more members using and reporting success, the perception of Pegasus' relative advantage further increased.

CSX proposed a variety of value propositions offering all members of the convenience store industry supply chain relative advantages. CSX's communication offerings were immediately realizable. CSX increased communication between convenience store owners (e.g., corporate offices) and their retail convenience stores. This allowed corporate offices to share current prices, proper product display, and store operation advice. CSX enabled retail stores to communicate sales back to their owners. CSX did not originally achieve use by marketplace members because CSX did not offer members an immediately realizable relative advantage. However, as the investor commitment section will discuss, even when CSX did offer an immediately realizable and quantifiable relative advantage, the investors still would not use the marketplace. Two of CSX's investors joined for the **wrong reasons** and as a result would not perceive the marketplace's relative advantage. McMurray Distributing joined CSX primarily to secure the Gulf Coast Oil service agreement. Momentum Manufacturing joined CSX because McMurray Distributing, their largest customer, requested their membership. Given that the environment was encouraging organizations to explore e-business, both McMurray Distributing and Momentum Manufacturing were interested in e-business endeavors. When the environment stopped encouraging e-business endeavors, these investors' interest lessened.

The finding that perceived relative advantage drives B2B e-marketplace use supports previous interorganizational information systems (IOIS) studies. Premkumar et al.'s (1994) EDI research links relative advantage to adaptation, internal diffusion, and external diffusion. Tabor's (2001) study links relative advantage to B2B EC use.

This section explains that member perceptions of the marketplace's relative advantage drives marketplace use. However, several factors drive marketplace members' perception of the marketplace's relative advantage. The sections below discuss each of these.

#### 8.1.1.1. Customizing to Existing Industry Practices

B2B e-marketplaces were originally designed to bring together buyers and suppliers electronically to do business. The goal was allowing buyers to become aware

of all the suppliers and shop the different suppliers and suppliers having access to more buyers. In most cases, business does not work this way. Buyers have prenegotiated contracts with preferred suppliers. Buyers like dealing with their existing suppliers because they know the suppliers will deliver the right product, on time, and in good condition. Because they have a relationship, suppliers will help buyers when they are in a pinch. Suppliers cultivate buyer relationships to achieve consistent, predictable sales. Suppliers and buyers spend years cultivating relationships. These relationships lead to synergies. Suppliers develop innovations that help their buyers. Buyers share information to help their suppliers predict sales and forecast production. Free, open marketplaces that allow any buyer to purchase from any supplier at anytime undermine these relationships.

The two marketplaces with higher use levels were initially positioned as free, open marketplaces. After struggling to achieve marketplace use, both marketplaces customized their offerings to accommodate the relationships inherent in existing business practices. We define customizing to existing industry practices as changing the marketplace to be consistent with existing industry operations.

NTX's founders understood technology, but did not understand transportation industry operations. NTX's initial marketplace was founded on shippers posting their loads and carriers looking at the website and accepting loads. This works well for loads not covered by preexisting contracts (e.g., independent carriers, small businesses, and ad hoc loads). Preexisting shipper-carrier contracts cover most loads. Shippers negotiate long-term contracts with carriers. Contracts consider price and delivering products on time and in good condition. In bidding shipper contracts, carriers try to develop high utilization transport lanes both on the front and the backhaul.

To achieve enough transaction volume to survive, NTX had to modify their marketplace's business model to accommodate existing business practices. NTX made their software available to shippers to manage their existing freight contracts. Using NTX to execute existing carrier contracts led to shippers using NTX for loads not covered by preexisting contracts. In executing existing freight contracts using NTX,



shippers required their carriers to use NTX. This expanded the carrier base using NTX for all shippers. The following quote illustrates this.

When the marketplace didn't take off, we went after customer-automated solutions that the customers needed with their existing carriers. This was facilitated over the marketplace's technology but not quite the original marketplace conception.

---Regional Sales Director, NTX

Pegasus' original vision of an open marketplace for utility procurement conflicted with utility industry practices. Many items that utilities purchase are customized to that particular utility. For example, if a buyer purchases wood poles over an open marketplace, the wood poles will probably not meet the utilities' specifications (e.g., pointed vs. flat tops, resin treatment vs. no treatment). In addition, at times utilities have to rebuild utility infrastructure because of inclement weather (e.g., tornado, ice storm). Because of this, utilities value long-term supplier relationships as they depend on their suppliers to provide emergency materials to rebuild the infrastructure. Given this scenario, for the bulk of utility purchases, utilities do not want buyers shopping from the population of suppliers. Rather, utilities want buyers to do business with preapproved "channel partners." For repetitive purchases, utilities negotiate contracts with these preferred suppliers. In developing these contracts, utilities consider price, specifications, quality, and noncontractible services. They procure products based on prenegotiated supplier contracts.

To achieve member use, Pegasus modified their original vision of their open marketplace business process to accommodate these industry practices. Pegasus customized their marketplace to help utilities negotiate supplier contracts. Periodically, utilities put supplier contracts out for bid. In doing this, utilities request different suppliers submit proposals for evaluation. The utility then evaluates the supplier proposal on price, capacity, reputation, and other criteria. Based on the proposals, the utility selects a supplier and enters into a long-term contract.

Pegasus developed a request for quote (RFQ) function to automate this process. The function allows utilities to electronically communicate available business to

suppliers. The function allows utilities to post a request for quote form soliciting information from suppliers (e.g., pricing, capacity, replenishment frequency). Suppliers enter their information on the request for quote form and the utilities can then choose a long-term supplier. For the contract term, utilities purchase items from the selected supplier at prenegotiated prices. For the purposes of achieving marketplace use, utilities would then purchase these items over Pegasus' marketplace.

Pegasus has developed a number of value propositions similar to the request for quote function. These value propositions accommodate existing industry practices by facilitating periodic evaluation of supplier contracts. The value propositions also recognize that on a daily basis utilities purchase products based on prenegotiated contracts with preapproved suppliers. Utilities do not want their buyers shopping and purchasing products from the entire population of suppliers. The following quote illustrates this.

Large organizations with trained procurement people do not want their employees to shop. They aren't interested in price comparisons. They want their employees purchasing off of negotiated contracts. Large organizations want to limit their employees' field of view. They don't want a place to compare prices in professional procurement shops. They want to keep people away from maverick procurement processes. Our marketplace is not really for shopping and comparing prices. The idea of shopping online and comparing is dead. Now, a marketplace is a way of accessing an organization's own negotiated contracts and integrating with suppliers.

---Sales Vice President, Pegasus

CSX tried to customize their marketplace to accommodate convenience store industry business practices. Both industry investors (McMurray Distributing and Momentum Manufacturing) provided industry experts to explain convenience store industry operations to the marketplace designers from the distributor's and manufacturer's perspective. As part of this, CSX developed an offering called SmartPromo. SmartPromo was a software package designed to improve the product promotion process for the entire industry. However, even with this offering, neither

McMurray Distributing nor Momentum Manufacturing would admit that marketplace use would help their business.

I swear it was just like a poker game with each company holding their cards. They didn't want to admit it was valuable to them or give too much information because if it was valuable to them then they might have to pay for it. When we started it they said we'll participate in the collaboration but we're not going to buy it.

---President and Chief Operating Officer, CSX

Two IOIS studies (Grover 1993, Ramamurthy et al. 1999) find that IOIS that are similar to existing practices facilitate IOIS adoption and use. These studies are in customer-based IOIS adoption and electronic data interchange diffusion contexts. This study is the first to link customizing the e-marketplace to existing industry practices to e-marketplace perceived relative advantage and ultimately e-marketplace use. This is probably because our data provided a contrast of e-marketplaces that originally did not fit with industry practices and that then later customized their offering to support the industry practices.

#### 8.1.1.2. Supporting Low-leverage Procurements

Supporting low-leverage procurements drives marketplace perceived relative advantage, which then drives marketplace use. We define low-leverage procurements as situations where individual marketplace members represent a low volume and or non-repeat business to suppliers. In these situations, individual marketplace members do not have leverage to negotiate pricing. Because buyers do not repeatedly purchase these items, they also do not have efficient systems to support procurement in these situations. Indirect materials procurement usually represents a low-leverage procurement situation. Indirect materials are not used in the direct production or delivery of an organization's goods or services. Examples of indirect materials for the four e-marketplaces in this study include office supplier and cellular phones.

Marketplaces can support low-leverage procurements by developing strong vendor relationships. Marketplaces are able to do this because the aggregation of all marketplace members represents substantial business to the supplier. Representing a

group of members, the marketplace can negotiate supplier pricing. The supplier will give the marketplace member better pricing than the member could attain individually. Marketplaces further support low-leverage procurements by designing efficient systems to accommodate these situations. As such, supporting low-leverage procurements drives marketplace perceived relative advantage.

In NTX's case, members use the true, open marketplace feature to procure freight not covered by existing freight arrangements. Shippers post loads when they have shipments that are non-repetitive and/or less than a truckload of freight. Without the marketplace, these situations require calling an array of carriers for freight quotes. Carriers will not give their best price because this is non-repeat and/or low volume business. Using NTX makes the procurement process more efficient, and since NTX represents substantial repeat business, carriers offer lower prices. The following quote illustrates this.

If a small mom and pop called and wanted us to haul for them they wouldn't get a discounted price because they don't represent very much business. When these mom and pops go through a broker or something like NTX they can get a better price because NTX represents a lot of business.

---Low seller, NTX

A carrier is in a low-leverage procurement situation when their truck is empty through some portion of a route. Filling empty truck capacity increases profits. Carriers use NTX in these situations.

Since Pegasus has worked to develop strong supplier relationships that the utilities individually could not develop, it offers a relative advantage in procuring indirect materials. To suppliers, Pegasus represents substantial repeat business from an entire industry, whereas each utility does not. In these situations, Pegasus has negotiated better pricing than the utilities could negotiate. In addition, low-leverage product purchases occur only occasionally so the process is manual. Pegasus' systems increase efficiency in low-leverage procurement. The following quote illustrates this.

Pegasus has had some success in indirects: cellular phones, wireless service, office supplies. They have found fertile ground in indirects. While we buy a lot of indirects we are not the indirect suppliers' biggest customer and so we don't get the best pricing in indirects. Pegasus is able to leverage the buying power of all the utilities to get better pricing on indirects.

---High buyer, Pegasus

Marketplaces offer more value in the procurement of indirects. The need is unexpected. When you buy something you don't buy everyday you need to go through the catalogue, find what you want and hand it over to a buyer. With indirects there are not prenegotiated contracts. Studies have been done that show in indirect procurement a \$17 product can end up costing \$120 to own and use.

---Sales Vice President, Pegasus

The following quote illustrates that indirect material suppliers participate in marketplaces because marketplaces give access to an entire industry.

We got involved in this marketplace because we wanted to do business with the utility industry. Pegasus would introduce us to the utilities at a higher level and make them take a serious consideration in doing business with us.

---High seller (office supplies), Pegasus

The existing IOIS literature does not link supporting low-leverage procurements to IOIS relative advantage or IOIS use. This may be because e-marketplaces are actually competing with existing IOIS such as electronic data interchange. Years ago organizations implemented IOIS systems to make their existing business processes more efficient. These IOIS were normally implemented to streamline the procurement of frequently used products (e.g., direct materials). In evaluating how to use B2B e-marketplaces, organizations are comparing the e-marketplace to their existing IOIS. Since the organizations have worked for years to cultivate relationships with their existing trading partners and to develop interorganizational information systems supporting this relationship, e-marketplaces do not offer a relative advantage in these situations. Since organizations do not have the same trading partner relationships or

automated processes for indirect materials, e-marketplaces that support these situations offer a perceived relative advantage.

#### 8.1.1.3. Fee Structures

The fees associated with B2B e-marketplace use and how the fee structures are communicated drives marketplace perceived relative advantage, which then drives marketplace use. We define fee structures as the financial amount the marketplace charges members for its services. The higher the marketplace's fees and the less certain the marketplace's benefits for the fees, the lower the marketplace's relative advantage. Communicating fees where member organizations see an immediately realizable quantifiable benefit in excess of the fees drives marketplace relative advantage.

Organizations pay nothing to participate in NTX. NTX charges a transaction fee on every load tendered through NTX's marketplace. However, carriers and shippers never see the fee. Shippers post what they will pay for a carrier to haul a load. NTX then deducts its fee and posts the load at shipper's price less its fee. Carriers see the reduced price and can choose to accept the load. The load is tendered at acceptable prices for both parties.

Pegasus' twenty-one founding utilities put up a \$105 million dollar investment in Pegasus. Pegasus also charges utilities an annual membership fee. When Pegasus facilitates a contract, it charges utilities a percentage of the savings over the contract term. For auctions Pegasus charges an event fee. Pegasus originally charged a \$2 transaction fee to both buyers and suppliers for every purchase order executed through the marketplace.

In marketplace use decisions, utilities consider Pegasus' fees. On one hand, the magnitude of each utility's investment drives the utilities to continue to explore ways of using Pegasus. On the other hand, utilities consider the fees vs. the relative advantage before using Pegasus' offerings. The following quote illustrates this.

We are developing cost models to determine whether to buy things from Pegasus or to use another option.

---Low buyer, Pegasus

When Pegasus started, it had trouble attracting suppliers. Part of the suppliers' reluctance was that Pegasus was charging \$2 per purchase order to both buyers and sellers for transactions executed over the marketplace. Pegasus was also charging suppliers a membership fee. Pegasus' marketplace was not used extensively until the marketplace waived up-front supplier membership fees and supplier purchase order fees. The quotes below illustrate this point.

The suppliers were very opposed to Pegasus at the time, because Pegasus was charging huge fees to do business over the marketplace.

---Nonmember, Pegasus

Originally they (suppliers) were going to have to pay. But Pegasus has found out that they will not be able to get vendors on if they make them pay. So they have waived the fee for the first year. They are likely to waive the fee for the years to come.

---Low buyer, Pegasus

We couldn't play when marketplaces were charging suppliers so much. But now that the marketplaces aren't charging suppliers to participate we go after it.

---High seller, Pegasus

Pegasus' offerings with the most use are offerings where Pegasus' fee is a percentage of the savings earned by the buyer or seller. With this approach, utilities compare their current pricing to Pegasus' pricing. Pegasus' fee is a percentage of the savings.

CSX requires members pay up-front fees to use CSX's marketplace. Each retail convenience store pays \$100/month to participate in CSX's marketplace. Suppliers pay a monthly fee to access aggregated end consumer sales data. CSX also charges fees for transaction processing. Since CSX's fees were up-front and not tied to a quantifiable benefit, CSX's target members had trouble perceiving CSX's relative advantage. As such, most did not join or use the marketplace. The following quote illustrates this.

If you look at what the marketplace wanted to charge us for joining \$250 /store\* 2,200 stores\*12 months, that is \$6.6 million dollars. We could build stores for that.

---Nonmember, CSX

Premkumar et al.'s (1994) electronic data interchange work provides some support for our finding that fee structure drives perceived relative advantage, which ultimately drives e-marketplace use. Premkumar et al. find low cost facilitates adaptation, internal diffusion, and external diffusion.

#### 8.1.1.4. Reporting Price/Sales Benefits

Both high use marketplaces measure each member organization's transactions and calculate each member's price or sales benefits from conducting transactions via the marketplace. The marketplace then reports these benefits to each marketplace member. The marketplace reports usual price less marketplace price to organizations purchasing items via the marketplace. The marketplace reports sales volume to organizations selling products or services via the marketplace. As such, the model proposes reporting price/sales benefits drives marketplace perceived relative advantage. We define reporting price/sales benefits as providing marketplace members documentation showing cost savings from procuring goods and services via the marketplace and/or documentation showing increased sales from marketplace use.

Unfortunately, the data does not allow a contrast between reporting price/sales benefits and not reporting these benefits. NTX and Pegasus reported transaction results and had higher use levels. CSX was only used for corporate communication to Gulf Coast Oil retail stores, and therefore had no transaction results to report. We include reporting price/sales benefits as a perceived relative advantage driver because the participants repeatedly referred to these reports as an indicator of the marketplace's relative advantage and their marketplace use.

Shippers calculate price benefits from using NTX in two ways. Some shippers provide NTX the price they usually pay a carrier to deliver a load. NTX then posts the load at a price, reduced by NTX's fee, to its website for carriers to view. When a carrier



accepts the load, NTX reports to the shipper the savings from using NTX to tender the load. NTX calculates shipper savings by the shipper's usual load price less the carrier's accepted price reduced by NTX's transaction fee. Some shippers enter the price they are willing to pay a carrier to deliver a load. In these cases, the shipper maintains a spreadsheet showing the usual shipping price for the load. Shippers calculate their savings by taking what they usually pay for the load less what they paid via NTX. In these cases, carriers see what the shipper is willing to pay to tender the load less NTX's fee. Carriers receive reports showing the number of loads tendered via NTX and the price per load.

NTX's use results in substantial efficiency benefits. Before NTX, when shippers had a load that was not covered by an existing carrier arrangement, the shipper had to call different carriers to obtain prices and availability for hauling the load. Depending on availability, carriers' freight quotes varied substantially. As such, securing a carrier for a load at a reasonable price could take hours. While the respondents recognized the process improvement, they spoke of and reported the marketplace's benefits only in terms of freight price reductions.

Pegasus struggled to achieve marketplace use. Once some members began doing business over the marketplace, Pegasus documented the results and provided reports showing utility savings and supplier sales from marketplace use. Industry participants began seeing Pegasus' relative advantage and marketplace use increased. The following quote illustrates this.

Getting data about their successes with Pegasus helps companies get more involved with Pegasus. Suppliers love analytics. This gives them more information. Analytics helps facilitate marketplace use.

---President and Chief Executive Officer, Pegasus

Like NTX, Pegasus' reports focus on decreased prices for buyers and increased sales for suppliers. Pegasus' value propositions included efficiency improvements. However, neither the utilities nor Pegasus included this in a report of marketplace benefits. The following quote illustrates this.

In evaluating Pegasus, the company isn't looking at the total cost of ownership for products. Pegasus has knocked 2 weeks off of some procurement processes. In evaluating Pegasus, we have to consider the total cost and benefits of ownership.

---Low buyer, Pegasus

While NTX and Pegasus' use increased efficiency and improved business practices, both marketplaces only reported benefits in terms of price reductions and sales increases. This is ironic since these marketplaces and their members emphasized marketplace efficiency value propositions, and yet even with efficiency improvements, the marketplaces and their members did not measure these results. As such, the model proposes reporting price/sales benefits, not entire marketplace benefits, drives marketplace use.

The marketplace participants' incentive systems may explain why the marketplace and marketplace members only measured benefits in terms of price reductions and sales increases. Organizations and employees typically track results based on their incentive systems. Procuring products at lower prices is a typical performance metric for procurement personnel. Increased sales is a typical performance metric for sales people.

The existing IOIS literature does not recognize reporting price/sales benefits as a driver of perceived relative advantage or IOIS use. Previous IOIS value propositions were to develop closer business partner links and increase efficiency. The value proposition of e-marketplaces is reduced prices and increased sales. Since e-marketplaces have intended benefits different than the other IOIS, their relative advantage drivers will also differ. In addition, our study is grounded in the experiences of organizations actually implementing e-marketplaces, whereas much of the existing IOIS literature is grounded in the previous literature and interpretations of preexisting theories.

### 8.1.2. Investor Commitment

At the beginning of this study, B2B e-marketplaces were new. Marketplaces and member organizations were both learning how to make marketplaces work. We were involved with Pegasus and CSX during both marketplaces' inception. Both marketplaces envisioned themselves as open marketplaces for their entire industry to conduct business. Investor commitment was critical as both marketplaces struggled to achieve marketplace use. We define investor commitment as the founding organizations making efforts to use the marketplace and/or providing the marketplace feedback to increase the marketplace's relative advantage in order for the marketplace to be used.

When Pegasus went live in January 2001, most of its investors tried to use the marketplace. When the marketplace didn't provide a relative advantage over the investing utilities' existing business practices, the utilities notified Pegasus. As Pegasus improved the marketplace by introducing new offerings, the utilities would evaluate and try to use the offerings. These efforts show that at least some of Pegasus' investors were trying to use the marketplace. By struggling through and giving feedback, the investors helped Pegasus design offerings that provided the utilities a relative advantage. As part of investor commitment, the investors influenced select suppliers to conduct business with them over the marketplace. This component of investor commitment increased marketplace use. Investors and select suppliers conducting business over the marketplace signaled that the marketplace was a viable business option, further driving marketplace use.

CSX's original value proposition was helping corporate offices communicate with their retail convenience stores. CSX envisioned themselves as becoming a marketplace for the entire convenience store industry. To do this, CSX needed their investors to use the marketplace's offerings and then require their business partners' marketplace use.

CSX's initial offerings did not provide an immediately realizable relative advantage to the two industry investors. However, CSX improved and offered a value proposition streamlining the industry promotion process. Periodically, manufacturers run

product promotions to increase sales. The promotion process involves the manufacturer communicating the promotion to the distributor and the distributor then communicating the promotion to the retailer. Retailers are paid a certain amount for every promotion item sold during the promotion period. Most retailers do not scan sales to the end consumer. In this type of promotion, manufacturers do not have records of retail store purchases since promotion items are sold through a distributor. As such, calculating each retail store's promotion sales during the promotion period involves manufacturer field representatives visiting each store and counting inventory before and after the promotion period. The distributor supplies the manufacturer each store's purchases during the promotion period. CSX simplifies the promotion process. CSX allows manufacturers to communicate promotion information directly to retail stores. Since CSX includes scanning technology, CSX allows promotion sales to be communicated back to the manufacturer. CSX pilot tested the effect of using CSX to communicate product promotions to retail stores. The pilot tests indicated that when promotions were announced over CSX, sales of the promotion product increased earlier and sustained longer compared to traditional product promotion communication channels.

Given that CSX's offerings included a realizable relative advantage for each member organization, why were the Gulf Coast Oil stores the only users? Why did Gulf Coast Oil only use the marketplace for communication? CSX's other members joined for the wrong reasons and therefore were not committed investors. McMurray Distributing joined CSX primarily to secure the Gulf Coast Oil contract. Their secondary purpose was to become involved in EC. Momentum Manufacturing joined because their largest customer, McMurray Distributing, asked them to join. Momentum Manufacturing was also interested in learning about EC. Since neither organization joined the marketplace because of the marketplace's relative advantage to business operations, they were not committed investors and would not perceive CSX's relative advantage to their business operations. In addition, they made no efforts to use the marketplace. The quotes below illustrate this.

The companies openly said they were going to make no efforts to adopt the technology of the marketplace or integrate it into their business.

---President and Chief Operating Officer, CSX

Big companies like Momentum Manufacturing get involved because we ask them to and then they just charge their investment to advertising expense. They get involved but don't really care what happens.

---Low seller and buyer, CSX

Gulf Coast Oil still does their business the same way they have always done business with EDI and telxon units. When McMurray Distributing got involved in CSX, McMurray Distributing assumed Gulf Coast Oil wanted to do business via CSX, but they have not moved that direction.

---Low seller and buyer, CSX

I came home and realized early on that we were going to have problems because McMurray Distributing did not plan to use the exchange for their invoices or reorders. They made a commitment to join and contribute cash and intellectual capital. It was a self-fulfilling prophecy if they didn't use it then no one was going to use it.

---President and Chief Operating Officer, CSX

When RJR saw that Momentum Manufacturing was moving slow they said why bother. This should have worked. It was dependent on the shareholders. The investors must be passionate customers. The viability of the marketplace depends on it.

---President and Chief Operating Officer, CSX

Several IOIS studies have linked investor commitment to IOIS use. Tabor's (2001) work links management commitment to B2B EC use. Crook and Kumar (1998) link senior management commitment to electronic data interchange use. Ramamurthy et al. (1999) link internal support and customer support to electronic data interchange diffusion. This is the first research in an e-marketplace context linking investor commitment to e-marketplace use.

Our findings also indicate investor commitment drives perceived relative advantage. The existing IOIS research does not link investor commitment to perceived

relative advantage. This may be because the previously studied phenomena did not provide a contrast of an IOIS without a perceived relative advantage and then the committed investors providing feedback to develop the IOIS' perceived relative advantage. Our data did. In addition, the previous research may not have been designed to capture such a phenomena. Much of the previous research is based on testing preconceived relationships instead of discovering relationships. Our research was grounded in the experiences of the organizations implementing e-marketplaces so our research captured this.

#### 8.1.3. Support

Support drives perceived relative advantage and marketplace use. We define support as helping marketplace members identify situations in which marketplace use can provide benefits, training marketplace members to use the marketplace, and answering questions associated with marketplace use.

NTX did not originally have sales representatives supporting member organizations' use efforts. During this period, NTX struggled to achieve use. NTX later added sales representatives. NTX's sales representatives help potential members identify situations in which using NTX can reduce freight costs, train members to use NTX, and answer questions associated with using NTX. When NTX began supporting member use, NTX's marketplace use substantially increased.

Pegasus did not originally have many people dedicated to supporting the utilities' marketplace use efforts. At the start, Pegasus introduced offerings to the utilities without the utilities' input and without helping the utilities understand or use them. The following quote illustrates this.

At first Pegasus had this attitude of “throwing over the fence” and a desire to be on the leading edge. As such they were coming up with these solutions that the utilities didn't need and just throwing them over the fence at them.

---Low buyer, Pegasus

With the utilities struggling to use and see Pegasus' value, Pegasus introduced buyer development managers. Buyer development managers help the utilities identify areas where Pegasus' use can offer benefits and train utilities to use Pegasus. With the introduction of buyer development managers, more utilities started using Pegasus more often.

Pegasus' members also helped one another with marketplace use. Pegasus introduced some suppliers to the marketplace. Once Pegasus negotiated agreements with these suppliers, the suppliers called on the utilities to do business with them over Pegasus. These suppliers trained the utilities to do business over the marketplace. In one example, Office Plus installed icons on the utilities' computers and explained how to use Pegasus to purchase office supplies from their company.

In other situations, utilities use of Pegasus was contingent on the utilities' supplier membership and use. Many member utilities influenced their suppliers to join Pegasus, and with Pegasus' support, helped these suppliers do business with them over Pegasus. The quotes below illustrate support as a marketplace use driver.

We prefer to team up with marketplaces that have an external sales force like Pegasus. That way they get it going once the organization has decided to join. That way we don't have to be the bad guy and say, hey you wanted to do business this way and had us invest in all of this and now you aren't using it. That way the marketplace can work with them to use it.

---Low seller, Pegasus

Originally, Pegasus devoted no effort to getting utilities to change to use the marketplace.

---Low buyer, Pegasus

You may have the best value proposition in the world, but if they don't understand it they will not adopt and use it.

---Buyer Development Manager, Pegasus

CSX had a support center to help retail stores with the marketplace. CSX did not have field representatives helping member organizations understand or learn to use the marketplace.

Crook and Kumar's (1998) finding that implementation support drives EDI use supports our finding. However, our study is the first to link support to use in an e-marketplace context. In addition, our study is the first in an IOIS context to link support to perceived relative advantage. This may be because our study was grounded in the experiences of organizations implementing e-marketplaces. As such, the data provided a contrast of organizations' e-marketplace use perceptions before and after e-marketplace support.

## **8. 2. CONCLUSION**

This chapter explores marketplace characteristics driving marketplace use. This chapter is based on in-depth field interviews and document reviews. The field research includes four B2B e-marketplaces, buyer and supplier member organizations within each marketplace, and a non-member organization within each marketplace. We compared the four marketplaces' use levels. We also compared Pegasus and NTX when they were struggling with use and once they achieved use. By analyzing the field notes, we found several characteristics distinguish high use and low use marketplaces. See Figure 11 and Table 11.

This chapter finds that perceived relative advantage drives marketplace use and the more a marketplace is used the higher the marketplace's perceived relative advantage. The chapter further finds that investor commitment and support drive both marketplace use and marketplace perceived relative advantage. Customizing to existing industry practices, supporting low-leverage procurements, fee structure, and reporting price/sales benefits drive perceived relative advantage.



Chapter VII shows that organizations join marketplaces for three reasons: relative advantage, business partner encouragement, and to deal with business environment change. This chapter shows that while organizations may join marketplaces for an array of reasons, extensive marketplace use is contingent upon the marketplace offering a currently realizable relative advantage.

#### 8.2.1. Comparison to Original Model

The original model, Figure 7, posits compatibility, uniform standards, and trust drive B2B e-marketplace use. The interview guides used in the field visits specifically solicited information about these drivers. The field note data analysis showed specific characteristics of compatibility drive marketplace use. It did not indicate that uniform standards or trust were major marketplace use drivers.

The original model defined **compatibility** as “the degree an innovation is perceived as being consistent with potential adopter’s existing values, past experiences, and needs” (Rogers 1995, p. 224). We operationalized compatibility as the degree a B2B e-marketplace integrates with existing industry operating procedures. Specifically, does the B2B e-marketplace technology integrate with existing systems? Do the business practices integrate with existing business practices?

The field notes indicate that the two marketplaces that achieved use (NTX and Pegasus) were originally not compatible with most industry practices. The marketplaces were based on the idea of shopping different suppliers and getting the best price. The industries these marketplaces were introduced in are characterized by long-term procurement agreements and automated systems supporting these agreements. As such, in most situations the marketplaces were not compatible with existing industry practices.

NTX and Pegasus were made compatible with low-leverage procurement situations. In low-leverage procurements, organizations shop and compare prices. The procurement process is manual. The model proposes supporting low-leverage procurements drives marketplace relative advantage.

Since NTX and Pegasus serve industries characterized by long-term procurement agreements and prenegotiated pricing, industry organizations have automated

procurement systems. When the marketplaces customized their offerings to support procurement from preselected suppliers, the marketplaces achieved more use. As such, we narrowed compatibility to how the marketplace became compatible: customizing to existing industry practices. NTX achieved higher use because many organizations fully integrated NTX into their organizations, using NTX to facilitate all of their carrier agreements. Pegasus achieved less use because utilities adopted it to support procurement of some existing contracts. Pegasus also struggled with technological integration within adopting organizations.

The model approaches compatibility different than the literature. The model links two compatibility dimensions (customizing to existing industry practices and supporting low-leverage procurement situations) to relative advantage. The model proposes that these compatibility dimensions drive a marketplace's perceived relative advantage, which then drives use. Previous IOIS research (Han and Noh 1999-2000, Premkumar et al. 1994, Ramamurthy et al. 1999, Tumolo 2001) links compatibility to IOIS use. This may be because this research did not observe incompatible or partially compatible systems and then system modification to increase compatibility.

The original model posits **uniform standards** drive marketplace use. We define uniform standards as having a standard way of describing products and services sold over the marketplace. In each marketplace we studied, we inquired about uniform standards. Every marketplace, except Pegasus, had uniform standards for describing products. Pegasus' members were working towards uniform standards. Currently in the utility industry, many variations of the same product exist. For example, when purchasing a wood pole the current product descriptions do not distinguish wood poles with pointed tops from those with flat tops or poles with resin from those without.

Uniform standards did not seem to be a marketplace characteristic driving marketplace use. One high use and both low use marketplaces had uniform product description standards. In all four marketplaces, prices for the same product vary by situation. Participants in all four marketplaces recognize that the marketplaces do not measure the value of noncontractible services.

The original model posits **trust** drives marketplace use. Trust refers to a reliance that promises made by the marketplace will be kept. These promises include on time delivery, adequate product quality, and privacy. The field notes did not provide enough information to determine whether trust drives marketplace use. One of the high use marketplaces, NTX, has trust assurances. The other high use marketplace, Pegasus, does not. The two low use marketplaces didn't have enough information on trust as a marketplace use driver.

NTX ensures trust in two ways. NTX requires carriers using NTX be certified. Certification involves maintaining current insurance and inspection. NTX also has a "three strikes you are out" rule for both carriers and shippers. If either party is late preparing, picking up, delivering, or receiving a load three times, they can no longer participate in NTX. NTX also fines members \$200 each time they break the rule.

Pegasus does not have trust assurance. When we asked Pegasus about trust and whether Pegasus made sure products sold over the marketplace are the right products, delivered at the right time, and of the appropriate quality, they said this was the marketplace members' responsibility. When we inquired about trust with member organizations, they had some trust concerns. Members were concerned about the marketplace having access to their data. Members were also concerned that the customer would blame them if something went wrong in transacting over the marketplace. The following quote illustrates this concern from a seller's perspective.

We worry about them taking our intellectual capital. They say they can take all of our items and scrub them so they are available on a catalogue. Well, we really don't want them to know all that information about our business. That is our intellectual capital. Also, marketplaces are so new, if we let them handle our items and something goes wrong when the customer orders the item, the customer blames us.

---Low seller, Pegasus

### 8.2.2. Research Implications

This chapter's findings offer insights to the existing IOIS literature, as well as to a number of theories underpinning this literature. In this section, we discuss the IOIS literature implications, as well as the theoretical implications of our study.

#### 8.2.2.1. Interorganizational Information Systems (IOIS) Literature Implications

As we discussed each of our study's findings in the chapter, we compared each finding with the existing IOIS literature. In the comparison, we recognized and cited other IOIS studies which agree with the particular individual findings in our study. Our literature comparison expanded to the IOIS literature, because very little e-marketplace research exists.

As a whole, our research finds customizing to existing industry practices, supporting low-leverage procurements, cost, reporting transaction benefits, investor commitment, and support drives perceived relative advantage. Our research finds perceived relative advantage, investor commitment, and support drive e-marketplace use. The e-marketplace literature does not recognize these drivers. In addition, very few of the IOIS studies recognize any of these drivers. Finally, neither the existing IOIS nor the e-marketplace literature links these drivers to perceived relative advantage. The few studies that do recognize these drivers link them to use.

Several reasons potentially explain the difference between our study and the previous literature. First, e-marketplaces are a unique type of IOIS that has not been investigated very extensively. Second, much of the previous research is grounded in the ideas of existing literature and theories. Our research allows new ideas and relations to emerge because it is grounded in the perceptions and experiences of organizations implementing e-marketplaces. Finally, because our research is longitudinal, we were able to contrast the absence vs. the presence of several factors that would not have emerged in investigations that were shorter.

#### 8.2.2.2. Theoretical Implications

In addition to offering insights to the existing IOIS literature, this study also provides implications to a number of theories underpinning the IOIS literature. These

include: innovation diffusion theory, institutional theory, transaction cost economics, and the electronic markets hypothesis.

**Innovation diffusion theory** (Rogers 1995) identifies innovation attributes influencing technology adoption and continued use. Innovation diffusion theory posits a user's technology adoption and continued use decision as rational choices based on the technology's characteristics. The theory posits decision makers adopt technology they perceive has greater relative advantage, compatibility, trialability, and observability; and less complexity. Innovation diffusion theory posits that the relative advantage of an innovation, as perceived by members of a social system, is positively related to its rate of adoption. The theory identifies "degree of economic profitability, low initial cost, decrease in discomfort, social prestige, savings in time and effort, and immediacy of the reward as subdimensions of relative advantage" (Rogers 1995, p. 216).

Innovation diffusion theory supports this chapter's finding that an e-marketplace's perceived relative advantage drives e-marketplace use. By identifying subdimensions of relative advantage, the theory further supports the finding that fee structure, reporting results, and supporting low-leverage procurements drive perceived relative advantage.

Innovation diffusion theory defines compatibility as "the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (Rogers 1995, p. 224). Our findings support innovation diffusion theory's proposition that compatibility is positively related to adoption. The B2B e-marketplaces in our study had difficulty achieving use. Two of the e-marketplaces modified their offerings to support existing business practices. When they did this, their members perceived that marketplace use could offer them a relative advantage and they then began using the marketplace.

The previous chapter supported **institutional theory** by showing that organizations joined e-marketplaces because they viewed the marketplace as a means of dealing with the business environment change toward EC. This chapter shows that an e-marketplace will not achieve significant use unless its members perceive the

marketplace offers a relative advantage over existing business practices. This extends institutional theory by showing institutional theory partially explains marketplace membership, but does not explain marketplace use.

**Transaction cost economics** (Williamson 1979, Williamson 1982, Williamson 1985, Williamson 1994, Williamson and Ouchi 1981) explains the difficulty marketplaces originally had influencing member use. Transaction cost economics recognizes that there are costs associated with procuring goods and services. These costs include the costs of negotiating, monitoring, and governing exchanges between people. The magnitudes of these costs determine whether goods and services are produced in-house or are purchased through a market. Transaction cost theory posits that organizations will choose the structure that minimizes these transaction costs.

B2B e-marketplaces were originally based on the notion of buyers using the marketplace to shop different sellers and compare prices in order to obtain the lowest price. This marketplace model did not consider the transaction costs associated with doing business this way. Having professional procurement people shop sellers on a regular basis takes time. This increases the transaction cost of product procurement. For standard, repetitive purchase products, most organizations have prenegotiated supplier contracts and automated purchasing systems. Organizations do not want their procurement people shopping suppliers on a daily basis.

Some marketplaces tried to assess up-front fees for each transaction conducted over their marketplace, regardless of benefit. This increased buyer and supplier transaction cost, and thus inhibited use.

The original marketplace model of shopping and comparing an array of sellers did not consider the uncertainty associated with doing business over an open marketplace. Are the products the quality the buying organization needs? How does the buying organization know the products will be delivered on time and in good condition? How does the selling organization ensure payment? Many organizations chose not to use marketplaces because the costs of managing the uncertainty associated with

purchasing products over a marketplace was greater than any potential cost savings from shopping suppliers and obtaining lower prices.

Marketplaces were originally envisioned as a place all sellers could list their products and prices. Marketplaces did not recognize that supplier pricing for the same product often varies by customer. Suppliers could not list their best prices on the open e-marketplace. This would cause the supplier to have to offer every customer this pricing, which would then hurt profit margins. In addition, long-term customer relationships would be damaged when existing customers saw that their supplier was offering the e-marketplace a better price.

Transaction cost economics also explains why some of the modifications the marketplaces made increased marketplace use. Both high use marketplaces in our study customized their marketplaces to support existing industry practices. Both marketplaces allowed buyers to use the marketplace to procure products from existing prenegotiated supplier contracts. This reduced transaction costs as buyers were not shopping and there was less uncertainty associated with managing preexisting supplier contracts. The marketplaces also tied their marketplace use costs to member benefits in excess of these costs. The marketplaces also found a niche in supporting low-leverage procurement situations. In low-leverage procurement situations, buyers and sellers do not frequently purchase from one another so automated processes and strong relationships do not exist. Marketplaces can improve the efficiency in these situations, reducing transaction costs.

One area that is contrary to transaction cost economics is the way marketplace member organizations report their benefits from marketplace use. Currently, organizations purchasing over the marketplace report what they usually paid for the product, less what they paid over the marketplace. In these situations, the marketplace also offered substantial efficiency benefits, such as reducing the labor involved in searching and comparing alternative suppliers. While the organizations in our study recognized this, they did not quantify it and only mentioned it in passing.

Based in transaction cost economics, Malone et al. (1987) developed the **electronic markets hypothesis**. The electronic markets hypothesis predicts that, with

the presence of electronic communication technologies, electronic markets will become the favored mechanism for coordinating material and information flows among organizations. The electronic markets hypothesis is based on conceptual analysis rather than systematic empirical studies. Our research provides empirical insight to the electronic markets hypothesis.

The crux of the electronic markets hypothesis is the move toward electronic markets from hierarchies. Malone et al. (1987) explain that markets coordinate the flow through supply and demand forces and external transactions between different individuals and firms. Hierarchies coordinate the flow of materials through adjacent steps by controlling and directing material flow at higher levels in the managerial hierarchy. When a buyer uses a single supplier, the relationship is hierarchical. When a buyer uses multiple suppliers, market forces govern the relationship.

Malone et al. (1987) explain that characteristics of the traded product affect whether the product will be traded over a market or governed by a hierarchy. The authors explain that products low in asset specificity and with simple product descriptions will be traded over electronic markets. Products with high product complexity and high asset specificity will be governed by hierarchy relationships in which buyers and suppliers are very tight.

Our finding that low-leverage procurement situations drive an e-marketplace's relative advantage and ultimately e-marketplace use supports Malone et al.'s (1987) proposition regarding the relationship between product characteristics and organizational form. The e-marketplaces in our study started out trying to be open e-marketplaces for all industry procurement. However, after member resistance, the e-marketplaces had to modify their business model. E-marketplace members have been using e-marketplaces in low-leverage procurement situations. Products purchased in these situations are not specific to the particular buyer-seller relationship and have standard product descriptions. Cellular phones, office supplies, and nonperishable freight are examples of items traded in these situations.



Our data also contradicts Malone et al.'s (1987) proposition. To date, even in the low-leverage procurement situations, e-marketplaces have not yet developed where buyers are routinely shopping and comparing suppliers. In Pegasus, the e-marketplace makers evaluate multiple suppliers and then establish a preferred relationship with one supplier for a particular product (e.g., office supplies). The e-marketplace participants then use the e-marketplace to procure products from that supplier. In NTX the e-marketplace changed the structure of the market, allowing sellers to choose from multiple buyers.

The data both support and contradict Malone et al.'s (1987) proposition that hierarchies will be used for products that are asset specific with complex descriptions. In the utility industry, buyers have strong relationships with suppliers of industry specific products like transformers and wood poles. Some of the industry specific products have many variations contingent on the particular utility's requirements. For these types of products, the utility and its suppliers have developed long-term relationships supported by automated procurement practices. Malone et al.'s proposition explains why open e-marketplaces did not work in these situations.

The data contradicts the electronic markets hypothesis as the e-marketplaces in our study have also been used to procure asset specific and complex products. Periodically, utilities purchase draglines. A dragline is a very large, custom designed, complex piece of equipment used in mining. A utility in our study used the e-marketplace to select a company to manufacture draglines. The utility supplemented the price information compared over the e-marketplace with manufacturer visits and product specification information. Further contradiction arises with industry vendor assessment. The utility industry periodically assesses their industry vendor contracts. The utilities are using e-marketplaces to assess industry vendors. Once the vendor is chosen, on a daily basis, products are usually repetitively purchased from the given vendor outside the e-marketplace infrastructure.

As part of the electronic markets hypothesis, Malone et al. (1987) posit the electronic brokerage effect. The electronic brokerage effect means that since electronic

marketplaces electronically connect many different buyers and suppliers through a central database, e-marketplaces can fulfill the same function as a broker. Malone et al. further posit that the electronic brokerage effect will “(1) increase the number of alternatives that can be considered, and (2) decrease the cost of the entire product selection process” (p. 488). Malone et al. also explain that buyers will establish e-marketplaces in order to maximize the number of alternative products and services available and the ease of comparing them.

Our findings in the “Customizing to Existing Industry Practices” section contradict this. The e-marketplaces in our study were originally based on the idea of an open e-marketplace where buyers compared suppliers. For frequently purchased items such as direct materials, the buying organizations in our study have resisted the e-marketplace benefit of routinely comparing alternatives. The e-marketplaces that have been successful in terms of attracting members and being used had to move their e-marketplace away from the idea of an open marketplace, facilitating routine supplier comparison, to an e-marketplace supporting existing supplier relationships. The buying organizations in our study explained that they have worked for years to develop relationships with their suppliers. They believe that their suppliers provide many more benefits than what can be measured on an e-marketplace (e.g., price). They believe their supplier relationships are important and the e-marketplace concept of routinely comparing alternatives damages the relationship. Furthermore, these organizations usually have infrastructure supporting their existing relationships. Current e-marketplaces are not as efficient as most of the infrastructure supporting long-standing buyer-supplier relationships.

Based on the electronic markets hypothesis, Bakos (1998) identified product, price, and transaction cost benefits associated with using electronic markets.

Bakos’(1998) recognition that electronic market use would lower search costs for buyers shopping for products may explain “low-leverage procurements” as a driver of marketplace relative advantage, and ultimately marketplace use. The B2B e-marketplaces in this study were intended to replace traditional business practices,

many of which are based on long-term contracts and automated procurement practices. Since organizations do not routinely shop and compare vendors in these situations, the idea of using an e-marketplace to compare prices increases search and transaction costs. However, in low-leverage procurement situations organizations do shop and compare and they do not usually have automated procurement practices. In these situations, e-marketplaces lowered search costs.

Bakos (1998) posits that because electronic markets facilitate increased information sharing and communication between buyers and sellers, they enable charging different prices to different consumers in different situations. This holds for the electronic hierarchies that preceded B2B e-marketplaces (e.g., electronic data interchange). However, charging different customers different prices actually hindered the original vision of open B2B e-marketplaces. E-marketplaces were originally envisioned as sellers listing their available products and prices and buyers shopping seller listings. The industries in which the marketplaces in our study were implemented had been doing business with point-to-point electronic connections, such as EDI, for years. As such, charging different consumers different prices was common. The original implementation of electronic markets did not support this. Suppliers did not want to join e-marketplaces and publish their best price. B2B e-marketplaces use increased when marketplaces customized their offerings to support pricing privacy and different prices for different customers.

The discussion above shows that in some cases the existing literature and theories support our findings. These situations increase our findings' validity and extend the IOIS literature and theories to a different context, B2B e-marketplaces. In other situations, our findings conflict with the existing literature and theories. This section identifies and examines these situations, offering greater insight both to our study's findings and the existing literature and theories.

### 8.2.3. Practical Implications

Marketplaces cannot rest once organizations join a B2B e-marketplace. Many organizations pay huge investment fees to join B2B e-marketplaces and then never use

them. What characteristics should marketplaces consider in designing marketplaces that will be used?

In situations where marketplace investors will also be marketplace members, make sure these investors are joining because they perceive the marketplace's value propositions offer their organization a relative advantage. If they are not, other organizations will not join or use because the investors aren't. In addition, marketplaces face challenges at inception. If the investors are not committed, they will be unwilling to try the marketplace's offerings and provide feedback to help the marketplace offer a relative advantage. This is in line with Grewal et al.'s (2001) work, which posits organizations that join marketplace for legitimacy motivations are less likely to use the marketplace.

Be aware of the practices within the industry in which the marketplace operates. Don't build a marketplace and then try to change the industry to suit the marketplace. Organizational change is hard but industry change is even harder. Find out where the pain points are in the industry and build the marketplace to accommodate the industry. In many industries, existing procedures are automated and purchases are prenegotiated. Market makers need to customize their marketplace to support these practices. On a daily basis, organizations do not want their buyers shopping. They want them purchasing from preapproved contracts at prenegotiated prices. Understand the situations in which member organizations do shop and build the marketplace to accommodate these situations. For example, most organizations periodically evaluate their supplier contract. Marketplaces are ideally suited for automating and streamlining this process.

Design the e-marketplace to support low-leverage procurement situations. Low-leverage procurement situations occur when organizations purchase items they do not purchase every day (e.g., indirect items such as cellular phones or office supplies). These situations are not automated. In addition, organizations have little negotiating leverage because they do not have strong relationships with these suppliers and they do not represent substantial, repeat business to these suppliers. Marketplaces can establish

relationships with these suppliers because they represent all of their members' purchasing power. By establishing these relationships and automating the procurement process, marketplaces can achieve a relative advantage for their members.

To stay in business, marketplaces need a means of generating revenue. Marketplace members do not want to pay up-front fees, as they perceive that these fees reduce profits. Marketplaces will be more likely to influence organizations to join and use the e-marketplace by tying fees to quantifiable benefits. By tying fees to a percentage of savings or increased profit, marketplace participants see the costs small in relation to the benefits.

In addition, marketplaces should report results from using the marketplace to participants. By seeing the relative advantage, members will continue to use the marketplace. These results need to be in cost savings or increased profit. Even in situations where marketplace use resulted in increased efficiency and reduced labor costs, marketplace members had little regard for this type of savings.

Finally, marketplaces must help their members use the marketplace. Marketplaces should conduct training sessions and have a support line for organizations struggling to use the marketplace.

#### 8.2.4. Future Research

This chapter is one of the first in-depth inquiries of marketplace characteristics driving B2B e-marketplace use. While we answered a number of questions, a number still remain.

Does the model hold in comparisons with other B2B e-marketplaces? We intended to compare marketplace use drivers across four marketplaces. However, Retail Matrix was never used. This forced a comparison between three marketplaces. Comparing the model to other marketplaces will increase the model's insights and generalizability.

When we began investigating marketplace characteristics driving marketplace use, we expected technology characteristics to drive marketplace use. However, technology rarely surfaced in the field notes. In addition, when we began contacting

organizations and asked to talk with the person in the organization that knew about the marketplace, we were rarely directed to information technology people. When we were conducting field visits with the marketplaces, we usually spoke with executives. When we were interviewing member organizations buying over the marketplace, we were directed to procurement people. When we interviewed marketplace suppliers, we were directed to sales people. What is technology's role and an information technology department's role in marketplace use?

In some areas, marketplace use lead to substantial business operation improvement. However, in reporting marketplace results, these benefits were not quantified. Marketplaces and member organizations reported reduced prices and increased sales. In some cases, efficiency benefits may result in more industry benefits than reduced costs or increased sales. How do marketplaces and members measure and communicate all the true benefits of marketplace use? Why do marketplaces and members that recognize efficiency increases not recognize them as a key benefit to marketplace use?

## CHAPTER IX

### RESEARCH QUESTION 3: WHAT ORGANIZATIONAL CHARACTERISTICS IMPACT AN ORGANIZATION'S BUSINESS-TO-BUSINESS ELECTRONIC MARKETPLACE USE?

Almost a year into the case studies, we were eating at a College Station, Texas BBQ stand with Mark, a utility Procurement Manager helping us with the study. Mark drew this picture (Table 12) on a napkin.

**Table 12 Utility Marketplace Use Levels**

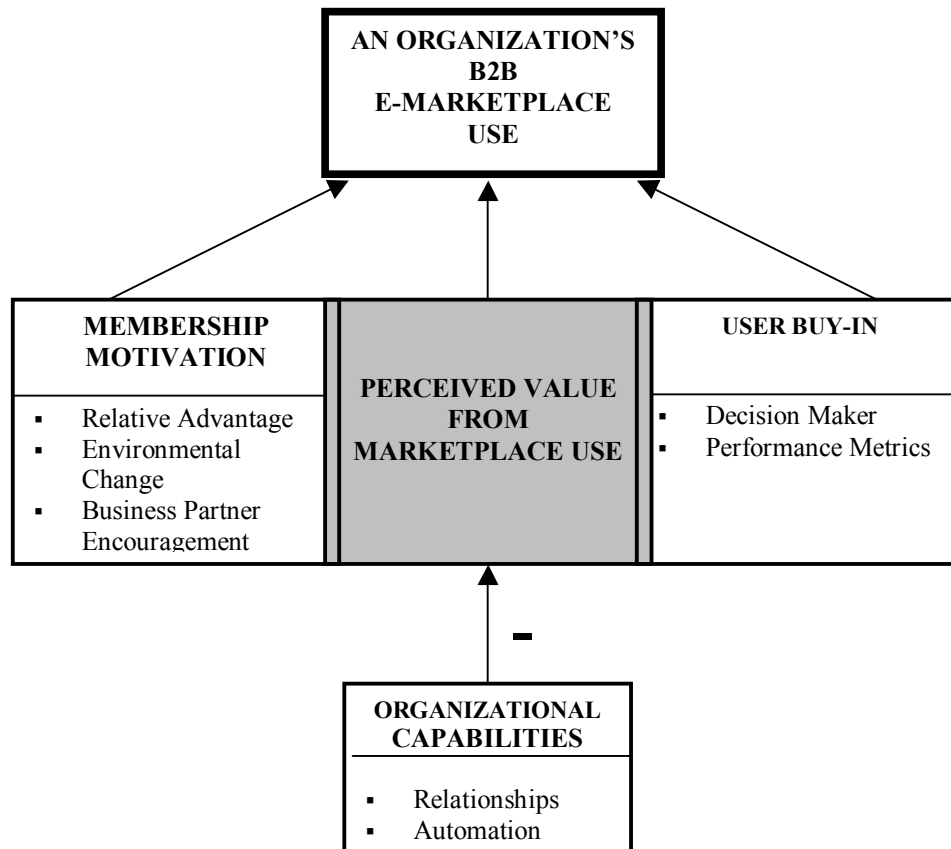
TOP			BOTTOM
3-4	4-6	5-7	2-3

He explained that ten months into Pegasus' "go live" date, Pegasus' participating utilities had different use levels. Three or four of the utilities were using Pegasus' marketplace heavily. Two or three utilities weren't using Pegasus' at all despite their \$85,000 investment and marketplace membership. This made us wonder why similar organizations using the same marketplace achieve different use levels? This forms the last research question and this chapter's discussion. What organizational characteristics impact an organization's business-to-business (B2B) electronic marketplace (e-marketplace) use?

To investigate this question, we interview buyers and sellers participating in each of the three functional marketplaces. We then code the data into categories for analysis. We compare use levels and organization characteristics for high users vs. low users in each of the three marketplaces. Since Retail Matrix was unable to solicit member

organizations that could conduct transactions to join their marketplace, Retail Matrix is not included in this analysis. The paragraphs below discuss the model. See Figure 12.

**Figure 12 Organizational Characteristics Impacting an Organization's B2B E-marketplace Use**



The model proposes membership motivation, perceived value from marketplace use, and user buy-in affect an organization's marketplace use. The model indicates membership motivation, perceived value from marketplace use, and user buy-in can overlap. We observed three cases in which the organization's motivation for joining the marketplace was the marketplace's relative advantage. Because the users perceived a value from marketplace use, the users bought in to the concept. In all three situations, the organizations immediately began using the marketplace. The model further proposes an organization's capabilities affect perceived value from marketplace use. The better an



organization's supplier or customer relationships and the more automated the organization's processes are, the less likely an organization is to perceive value from marketplace use.

The conclusion discusses drivers in the original model not included in the revised model, theoretical implications, practical implications, and future research.

## **9. 1. AN ORGANIZATION'S MARKETPLACE USE**

This chapter investigates what drives an organization's e-marketplace use. System use as a dependent variable has a long history in information systems literature. For a review see (Delone and McLean 1992). We define an organization's e-marketplace use as how many transactions the organization conducts over the e-marketplace and how often the organization accesses the e-marketplace. During the field visits, we collected data on the organizations' transaction volume, use frequency, and organizational self-categorization for the three months prior to the field visit. Based on this information, we categorize organizations as high or low users. See Table 13. All of the field visits to the organizations that were conducting transactions over the marketplace occurred between May and August 2002. As such, marketplace use levels were reported for about the same three-month period.

**Table 13 Organizational Use Level for the 3 Months Prior to the Field Visits**

	TRANSACTION VOLUME	USE FREQUENCY	ORGANIZATIONAL SELF-CATEGORIZATION	ORGANIZATIONAL CATEGORIZATION
NATIONAL TRUCKING EXCHANGE (NTX)				
R.E. Transport	56 bids	Daily	High seller	High seller
Southwestern Trucking, Inc.	8 bids	Hardly ever	Low seller	Low seller
Texas Plastics	720 shipments	More than 10 times/day	High buyer	High buyer
Leading Edge Brands (2 interviews)	100 shipments	Daily	Low buyer	Low buyer
PEGASUS				
Office Plus (4 interviews)	>500 transactions	More than 10 times/day	High seller	High seller
Mining Manufacturing	1 transaction	Hardly ever	Low seller	Low seller
Bearing Point Manufacturing	0 transactions	Not at all	Low seller	Low seller
Synergy	Unavailable	Unavailable	High buyer (Synergy is one of the top 2 Pegasus users)	High buyer
Gulf Coast Energy (Regulated)	900 transactions	50-60 times/day	High buyer	High buyer
Gulf Coast Energy (Unregulated)	600 transactions	More than 10 times/day	Low buyer	Low buyer
Lone Star Utilities (2 interviews)	485 transactions	Daily	Low buyer	Low buyer
U.S. Electric and Power	0 transactions	Not at all	Low buyer	Low buyer
C-STORE EXCHANGE (CSX)				
Momentum Manufacturing	0 transactions	Hardly ever	Low seller	Low seller
McMurray Distributing, Inc. (3 interviews)	4-5 distributions	Hardly ever	Low seller	Low seller
McMurray Distributing, Inc. (3 interviews)	4-5 distributions	Hardly ever	Low buyer	Low buyer
Gulf Coast Oil	0 transactions	More than 10 times/day	Low buyer	Low buyer

Transaction volume is the number of purchases or sales either conducted over or facilitated by the marketplace in the three months prior to the field visits. Because different industries and marketplaces have different transaction volumes, we compare organization transaction volume within each marketplace to categorize marketplace members as high or low. Some organizations measure transaction volume differently than other organizations. However, each type of organization within each marketplace measured transaction volume the same, so we were able to compare high and low volume users even though they measured transaction volume in units other than transactions. For example, National Trucking Exchange's (NTX's) members discuss bids and shipments. Carriers bid business. One bid can cover a number of loads or shipments. Since both carriers measures transaction volume in bids, we were able to distinguish high sellers from the low sellers.

Use frequency, how often the organization interacts with the marketplace, is measured along the following dimensions: more than 10 times per day, daily, a few times a week, weekly, monthly, hardly ever, and not at all.

Organizational self-categorization is how organizations categorize themselves. The study included organizations of a variety of sizes. Because of the transaction volume in large organizations, the transaction volume of a large organization that uses the marketplace minimally may exceed the transaction volume of a small organization that uses the marketplace extensively. As such, organizational self-categorization help classify organizations as high or low users. In addition, in evaluating the transaction volume and use level, determining the cut-off point between high users and low users can be difficult. An organization's self-categorization helps. During each field visit, we asked, "What organizations really use the marketplace? What organizations don't use the marketplace very much?" These responses helped select high users, low users, and nonmembers to participate in the study.

While not immediately relevant in the table, organizational self-categorization helps in situations where an organization is really using the marketplace, but because of their organization's size, transaction volume would not depict that the organization was

using the marketplace for everything. A small organization could conduct all their business transactions via the marketplace and not achieve the volume of a large organization that considers themselves a low user and only does business with one customer via the marketplace. Since the purpose of this question is investigating what organizational characteristics drive an organization to really use a marketplace, we consider the organization's self-categorization in how we categorize an organization.

Low users include organizations that do not use the marketplace very much in relation to the other marketplace participants and organizations that joined, but never conducted a transaction over the marketplace.

Several points in the table warrant clarification. We categorize Synergy as a high user, but we do not have the organization's transaction volume or use frequency. We interviewed Synergy's manager responsible for Synergy's involvement in Pegasus. She was able to answer all of the questions except Synergy's transaction volume and use level in the past three months. She had left Synergy in the previous year and was not privy to this information. We still categorized Synergy as a high user because three sources confirmed Synergy was one of the top two Pegasus users. The table includes Gulf Coast Energy (regulated) and Gulf Coast Energy (unregulated). Industry deregulation led to utility companies breaking up their business into regulated and unregulated sides. Gulf Coast Energy (regulated) and Gulf Coast Energy (unregulated) are two separate companies. Each company uses Pegasus differently. Each company has different people in charge of Pegasus. Each company has different users of Pegasus. McMurray Distributing, Inc. is a distributor. Distributors buy and sell. As such, McMurray Distributing fell into both seller and buyer categories. To date, we have been unable to interview a representative from Momentum Manufacturing. The information in the table regarding Momentum Manufacturing comes from Retailer Market Exchange's (CSX's) President and McMurray Distributing. McMurray Distributing, one of Momentum Manufacturing's largest customers, asked Momentum Manufacturing to join CSX.

## 9.2. MEMBERSHIP MOTIVATION

The model finds membership motivation drives an organization's B2B e-marketplace use. This means that the reason the organization joined the marketplace affects how much they use the marketplace. Chapter VII indicates membership motivation drivers include relative advantage, perceiving the marketplace as a mechanism for dealing with a business environment change, and business partner encouragement. Membership motivations are not exclusive. Organizations may join marketplaces for any or all of these reasons.

In Table 14, we categorized the participant organizations in the field studies by their motivations for joining the marketplace. For the categorization, we used the participant organization's responses to the question, "Why did your company join X marketplace?" As we probed deeper in the interviews asking about particular motivations for marketplace membership, the organizations would usually say, "yeah, there was a little of that." However, for the categorization, we're using the main reason they joined the marketplace, which was their response to the open-ended question.

When motivations have subdimensions such as relative advantage, which has two types (strategic vs. operational), we categorize organizations into relevant subdimensions. We note each organization by their use level (high vs. low) and how they used the marketplace (buyer vs. seller). The study included one distributor. The distributor fell into both buyer and seller categories.

**Table 14 Organizational Marketplace Membership Motivations as Drivers of an Organization's Marketplace Use**

	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS	C-STORE EXCHANGE (CSX)
RELATIVE ADVANTAGE			
Strategic		LB (Lone Star Utilities)	
Operational	HB, LB (Texas Plastics, Leading Edge Brands)	HS (Office Plus)	LB (Gulf Coast Oil)
BUSINESS PARTNER ENCOURAGEMENT			
Encourages Joining Only			LB, 2 LS (McMurray Distributing, McMurray Distributing, Momentum Manufacturing)
Encourages Joining and Doing Business Via the Marketplace	HS, LS (R.E. Transport, Southwestern Trucking, Inc.)	2 LS (Mining Manufacturing, Bearing Point Manufacturing,)	
BUSINESS ENVIRONMENT CHANGE Need to do EC		2 HB, 3 LB (Synergy, Gulf Coast Energy (unregulated), Gulf Coast Energy Regulated, Lone Star Utilities, U.S. Electric and Power)	LB, 2 LS (McMurray Distributing, McMurray Distributing, Momentum Manufacturing)

**Key:** The table categorizes user organizations by their use level (high vs. low) and how they use (sell vs. buy). This results in the classifications below.

HS-high seller, LS-low seller, HB-high buyer, LB-low buyer

The paragraphs below discuss Table 14 and organization marketplace membership motivation as a driver of the organization's marketplace use. The table and discussion illustrate joining a marketplace for relative advantage motivations leads to marketplace use. Operational relative advantage motivations lead to more immediate and higher use than strategic relative advantage motivations. Business partner

encouragement as a marketplace membership motivator is contingent upon the extent the requesting business partner wants to do business with the requested business partner over the marketplace. When organizations join marketplaces to deal with the business environment change, organizations later evaluate the marketplace's offerings. They choose to use offerings that provide their organization value.

Two studies (Grewal et al. 2001, Premkumar and Ramamurthy 1995) corroborate our finding that an organization's e-marketplace adoption motivation affects their e-marketplace use. Premkumar and Ramamurthy posit interorganizational information systems (IOIS) adoption decisions as proactive or reactive. In an IOIS adoption, usually one firm proactively initiates the action for IOIS adoption with another firm, and the other firm reactively decides to adopt the IOIS based on the proactive firm's initiatives. Premkumar and Ramamurthy's survey results indicate that proactive firms better integrate their EDI systems with other internal applications and more aggressively expand their external connectivity.

Grewal et al. (2001) investigate firm e-marketplace adoption motivations as predictors of the firm's ultimate e-marketplace use. The authors find emphasizing efficiency motivations and deemphasizing legitimacy motivations leads to firms achieving expert state in marketplaces. In expert state, firms have substantial knowledge about their marketplaces and procedural knowledge about doing business on the marketplace.

#### 9.2.1. Relative Advantage

We define relative advantage as a marketplace's offerings or value propositions "being better than the ideas they supersede" (Rogers 1995, p. 212). Organizations that join the marketplace because of the marketplace's relative advantage believe using the B2B e-marketplace will reduce product or service costs, increase product or service sales, and/or improve procurement practices. Relative advantages may be strategic or operational. Operational relative advantage is immediately realizable and achievable by one person. Strategic relative advantage is not immediately realizable and requires group coordination.

Senior management or corporate departments drive decisions to join marketplaces to achieve strategic relative advantage. Achieving strategic relative advantage involves buying organizations reengineering procurement procedures. One example may include moving from company negotiated supplier contracts, which are executed a variety of ways (e.g., face-to-face, phone, fax, computer), to marketplace negotiated supplier contracts, which are the executed via the B2B e-marketplace. Achieving strategic relative advantage involves selling organizations breaking into new markets and/or choosing a new way to sell products. For example, Office Plus joined Pegasus to service the utility market. When organizations join a marketplace to achieve strategic relative advantage, the organization has to change before the organization can actually use the marketplace. These changes may include changing business partners, contract negotiation procedures, and the mechanisms for buying or selling products on a daily basis.

Senior management, operational people, or both drive decisions to join marketplaces to achieve operational relative advantage. Operational relative advantage involves particular buyers in the organization choosing a new outlet to procure a product or service. For selling organizations, operational relative advantage involves using the marketplace to increase sales. Distinguishing between operational and strategic relative advantage for selling organizations is hard. The best way may be whether the decision to sell over the marketplace requires group coordination or whether selling via the marketplace can occur based on one individual's decision and actions.

Table 14 shows that one organization in the study cited strategic relative advantage as a marketplace membership motivation. Among other things, Lone Star Utilities saw Pegasus' membership as a process improvement facilitator. Compared to other Pegasus members, Lone Star Utilities is a low buyer. When Mark from Lone Star Utilities drew Table 12, they were in quadrant three. Several months later, Pegasus' Sales Vice President and Lone Star Utilities explained that Lone Star Utilities was moving up in use closer to quadrant two.



Several factors contribute to Lone Star Utilities' low Pegasus use. Pegasus' initial offerings were not as efficient or cost effective as Lone Star Utilities' existing business practices. Lone Star Utilities has a high regard for supplier relationships. Pegasus was originally based on shopping suppliers for price. Both organizations ultimately moved to a middle ground, but the mismatch slowed Lone Star Utilities' use of Pegasus. The following quote illustrates this.

I guess I'll tell you this, Lone Star Utilities knows it. Lone Star Utilities has a cultural challenge. They are very Southern in their thinking. We have this problem with our other Southern companies. They have a bias toward relationships. And, that's not bad. There is a component in our strategy where we do emphasize relationships. But sometimes these companies don't get it when we tell them your supplier is charging you a 400% mark-up. They say yes, but we do have a relationship with them.

---President and Chief Executive Officer, Pegasus

Lone Star Utilities' upper management made the decision to participate in Pegasus and then pushed the decision down to the purchasing group (the ones actually buying the products). The buyers thought management adopted Pegasus because they thought they weren't doing a good job. They also feared Pegasus would replace them. Lone Star Utilities tried to overcome this by educating their buyers and creating incentives to encourage buyers to use Pegasus. Incentives included employee recognition plaques and prizes donated by vendors. Performance measures were implemented that required the buyers to consider electronic procurement in their purchasing decisions.

Because Lone Star Utilities joined Pegasus to achieve a strategic relative advantage, the organization kept pushing to use Pegasus and funded efforts to enable use. As a result, Lone Star Utilities reaped some benefits directly from Pegasus' use and some side benefits. Lone Star Utilities approved funding to update technical infrastructure and inventory item descriptions. Management approved this funding because they joined Pegasus for a strategic relative advantage and saw these efforts as necessary to achieving this. In addition, Lone Star Utilities got to learn about best practice procurement procedures from utilities nationwide. Without Pegasus' umbrella,

utilities getting together to share information and collaborate would have caused concern in terms of antitrust violations.

Lone Star Utilities' case indicates organizations that join marketplaces to achieve strategic relative advantage may not immediately achieve use. However, because of the strategic relative advantage vision, organizations make efforts to move forward with using the marketplace. As the marketplace's value propositions and the organization's perception of the marketplace's immediate benefits come closer together these efforts result in increased use over time.

Table 14 shows joining marketplaces to achieve operational relative advantage leads to high use. In the NTX case, we interviewed a high buyer and a low buyer. Both buyers cited operational relative advantage in terms of immediate freight savings and a more efficient way to procure freight as their only marketplace membership driver. Office Plus joined Pegasus to gain access to the utilities market for selling office suppliers. We classify this as an operational relative advantage because Office Plus already had experience working with marketplaces and their decision to join Pegasus was made by a sales person and didn't require much organizational change. CSX evolved within Gulf Coast Oil. Before the term marketplace came to be, Gulf Coast Oil implemented an Intranet to improve communication between their corporate office and 3,500 retail stores. CSX formed by making this Intranet available to the entire convenience store industry. Gulf Coast Oil was a frequent CSX user because CSX offered Gulf Coast Oil an immediate operational relative advantage. We classify Gulf Coast Oil as a low buyer because, while they frequently used CSX for communication, the field notes do not indicate that they were ever able to conduct transactions.

These cases indicate marketplace membership motivated by achieving an operational relative advantage drives an organization's marketplace use.

#### 9.2.2. Business Environment Change

We define business environment change as organizations joining marketplaces because they view marketplace membership as a mechanism for dealing with the changing business environment. Many organizations in our study joined their given

marketplace because the environment was encouraging electronic commerce (EC) involvement. See Table 14. At the time Wall Street was pushing EC heavily and rewarding organizations for EC involvement. The following quote captures this.

We see our investment in Pegasus as a learning experience. We have to get in and learn about it. If we're successful that is good. But, if we're not then we can take what we've learned and use it in our next e-business project.

---Low buyer, Pegasus

Organizations thought business was changing rapidly and organizations that did not embrace e-business might not survive. A popular term was “e-business or out of business.”

Every utility in the study cited the need to do EC as why they joined Pegasus. Every member of CSX, except Gulf Coast Oil, also cited the need to do EC as their motivation for joining the marketplace. How do we explain this motivation's effect on use? During the EC boom, the organizations were hearing a lot of EC hype. The organizations had limited EC knowledge, but thought there must be something to it since everyone was asking if they had an EC strategy and analysts were saying organizations that didn't do EC were going to have problems. The desire to learn about EC fueled the organizations' marketplace membership. While organizations may join a marketplace to learn about EC, when the marketplace begins offering services, organizations will evaluate the services and will not adopt value propositions that do not offer a perceived value. This explains why so many organizations joined marketplaces but far fewer became high users.

### 9.2.3. Business Partner Encouragement

This study finds organizations that join a marketplace at their business partner's encouragement use the marketplace to the extent the encouraging business partner requires. We define business partner encouragement as an organization joining a marketplace because an organization they either do business with, or want to do business with, is a member of the marketplace and requests that they join the marketplace.

The data shows “business partner encouragement to join only” as a marketplace membership motivation results in hardly any use by the organizations that joined for this reason. We categorize McMurray Distributing as both a buyer and a seller since they are a distributor and their intended marketplace role was buying and selling over the marketplace. In an effort to secure a contract to service all of the Gulf Coast Oil stores, at Gulf Coast Oil’s request, McMurray Distributing joined CSX. As a distributor, McMurray Distributing does business any way their customer wants. Gulf Coast Oil never made efforts to do business with McMurray Distributing via CSX. Since winning Gulf Coast Oil’s contract fueled McMurray Distributing’s marketplace membership, McMurray Distributing only used CSX for 4-5 experimental distributions. McMurray Distributing never incorporated CSX into their business practices. The following quote illustrates this.

We got into CSX because we were trying to get Gulf Coast Oil’s business and Gulf Coast Oil wanted to do business with CSX. We don’t really look to improve processes. You can go down to our room and see how many different programs we have running. We want to do business with our customers the way the customers want to do business.

Gulf Coast Oil still does their business the same way they have always done business with EDI and telxon units. When we got involved in CSX we assumed Gulf Coast Oil wanted to do business via CSX, but they have not moved that direction.

---Low seller and buyer, CSX

When McMurray Distributing joined CSX, CSX requested McMurray Distributing’s help in influencing a key industry supplier to join. Momentum Manufacturing is one of the largest suppliers in the convenience store industry. McMurray Distributing is Momentum Manufacturing’s largest customer. McMurray Distributing requested Momentum Manufacturing join CSX, but never requested Momentum Manufacturing do business with McMurray Distributing via CSX. As such, Momentum Manufacturing joined CSX but never used the marketplace. The following quote illustrates this.

Big companies like Momentum Manufacturing get involved because we ask them to and then they just charge their investment to advertising expense. They get involved but don't really care what happens.

---Low seller and buyer, CSX

The case studies indicate “business partner encouragement to join and do business with the encouraging business partner” will result in the target organization using the marketplace to the extent the encouraging business partner requires.

Both carriers that joined NTX explained that they joined NTX because one of their trading partners wanted to do business with them over NTX. In R.E. Transport’s case, existing trading partners representing high volume drove R.E. Transport into the marketplace. In Southwestern Trucking’s case, NTX had one company that wanted to do business with Southwestern via NTX. When NTX approached Southwestern Trucking about this opportunity, Southwestern joined NTX and did business with this customer over the marketplace.

In both cases, the low suppliers we interviewed became involved in Pegasus at Lone Star Utilities’ request. Lone Star Utilities wanted to do an auction for their dragline bid. Mining Manufacturing participated in the auction and won the bid to build the two draglines. This is the only transaction Mining Manufacturing has done through Pegasus. Bearing Point Manufacturing also joined Pegasus at Lone Star Utilities’ request. While Bearing Point Manufacturing is involved in several marketplaces, they are a low supplier in Pegasus. This is partly because Lone Star Utilities has moved slowly in doing business with them over the marketplace.

Organizations joining a marketplace because their trading partners want them to join and conduct transactions with them over the marketplace are more likely to use the marketplace.

This section illustrates organizations that join a marketplace at their business partners’ encouragement, use the marketplace to the extent their business partner requires.

### **9.3. PERCEIVED VALUE FROM MARKETPLACE USE**

Chapter VII explains organizations join marketplaces to achieve a relative advantage, at their business partners' request, and/or if they view joining as a means of dealing with a changing business environment. However, as we investigated why some organizations use the marketplace they join and others do not, perceived value from marketplace use seems to be a major driver of an organization's marketplace use. We define perceived value from marketplace use as whether the organization's decision makers believe using the marketplace helps their organization achieve its operating objectives. In the paragraphs below, we discuss perceived value from marketplace use.

Table 15 categorizes the study's marketplace participant organizations by use level (high vs. low) and organization type (buyer vs. seller). The table also shows whether the organization mentioned a perceived value from marketplace use and the mentioned value. The table analysis combined with the case data explain perceived value from marketplace use drives an organization's marketplace use.

**Table 15 Analysis of Perceived Value from Marketplace Use**

	ORGANIZATION CATEGORIZATION	PERCEIVED VALUE FROM MARKETPLACE USE	WHAT VALUE
NATIONAL TRUCKING EXCHANGE (NTX)			
R.E. Transport	High seller	No	
Southwestern Trucking, Inc.	Low seller	No	
Texas Plastics	High buyer	Yes	Lower prices
Leading Edge Brands (2 interviews)	Low buyer	Yes	Lower prices
PEGASUS			
Office Plus (4 interviews)	High seller	Yes	More customers
Mining Manufacturing	Low seller	No	
Bearing Point Manufacturing	Low seller	Yes	More customers, tighter customer relationships
Synergy	High buyer	Yes	Unavailable
Gulf Coast Energy (Regulated)	High buyer	Yes	Lower prices
Gulf Coast Energy (Unregulated)	Low buyer	Yes	Lower prices
Lone Star Utilities (2 interviews)	Low buyer	Yes	Lower prices
U.S. Electric and Power	Low buyer	No	
C-STORE EXCHANGE (CSX)			
Momentum Manufacturing	Low seller	Unavailable	
McMurray Distributing, Inc. (3 interviews)	Low seller	No	
McMurray Distributing, Inc. (3 interviews)	Low buyer	No	
Gulf Coast Oil	Low buyer	Unavailable	

Table 15 shows all of the high users perceived a value from marketplace use except R.E. Transport. This is because R.E. Transport joined NTX to continue to do business with several of their existing customers. R.E. Transport didn't gain customers by joining the marketplace.

High buyers perceived the marketplace lowered prices. High sellers perceived the marketplace gave them more customers. This is interesting because marketplaces emphasize reducing supply chain costs by making industry practices more efficient rather than comparing prices and lowering supplier margins. However, the case data indicate that even when marketplaces offer supply chain efficiency benefits, marketplace buyers perceive and quantify the lower price benefits not the efficiency benefits. Both

Texas Plastics and Leading Edge Brands compiled reports comparing their usual freight rates to NTX's freight rates for the same route. The reports showed cost savings from using NTX. However, both companies noted that using NTX saved time in procuring freight. Before NTX, shipping organizations could spend many hours contacting carriers to obtain pricing and availability to ship a single load. NTX improves this process by allowing shipping organizations to post the load to NTX's website for carriers to view. Neither company quantified or emphasized this process efficiency as a driver of their marketplace use. Both companies emphasized lower freight rates as a driver of their marketplace use. The following quote illustrates a similar situation with Lone Star Utilities and Pegasus.

In addition, in evaluating Pegasus the company isn't looking at the total cost of ownership for products. Pegasus has knocked 2 weeks off of some procurement processes. In evaluating Pegasus, Lone Star Utilities has to consider the total cost and benefits of ownership.

---Low seller, Pegasus

Furthermore, the following case shows a marketplace reducing efficiency, but the member still participating because the marketplace increased customers. Office Plus is a high seller in Pegasus. Office Plus currently participates in 10 other marketplaces. During the EC hey day Office Plus was participating in 34 marketplaces. However, Office Plus explained that selling products over the marketplace, especially in hosted arrangements, is less efficient than traditional procurement practices.

Marketplace members can do business with Office Plus with punch out/round trip arrangements or hosted arrangements. When organizations choose a punch out/round trip arrangement, the organization goes to the marketplace website to procure products. The marketplace website reroutes the buying organization to Office Plus' website, which accesses Office Plus' internal catalogue. Buyers then shop from this catalogue. The catalogue integrates with Office Plus' existing systems, and therefore inventory and pricing are current.



When organizations do business with Office Plus over the marketplace using a hosted arrangement, the marketplace maintains pricing and item lists. This requires Office Plus to prepare Excel spreadsheets with all of the items the purchaser wants to view in the catalogue. Office Plus has to submit these spreadsheets to the marketplace monthly. Invariably prices change and available items are sold out. This leads to price corrections and stock outs.

The following quote shows increased sales is more important as a marketplace use driver for Office Plus than increased efficiency.

Every customer can potentially have different pricing, so everyone we are doing a hosted agreement with I have to send a file. In this case the utility has to pay hosting fees. The risk in hosting is that the information is out of date as soon as I send it. Hosted agreements are lots of work and in the end the member pays.

We don't see marketplaces as reducing costs and in fact it increases our product and supply chain costs, especially with the hosting arrangements. More business is why we got into the marketplace.

Being in Pegasus gave us a recommended license to hunt. By joining Pegasus we got credibility and it made the utilities give us a more serious look at a higher level.

---High seller, Pegasus

Two types of low users exist. Perceived value low users (Leading Edge Brands, Bearing Point Manufacturing, Gulf Coast Energy (Unregulated), Lone Star Utilities, and Gulf Coast Oil) consistently use the marketplace or are making efforts to use the marketplace. Table 15 shows each of these low users, perceived value from joining the marketplace. Non-perceived value low users (Southwestern Trucking, Inc., Mining Manufacturing, U.S. Electric and Power, Momentum Manufacturing, and McMurray Distributing) have never completed a transaction over the marketplace, have experimented with the marketplace and decided not to continue use, or joined the marketplace to transact with one customer. Table 15 shows none of the low users in this

second category perceived a value from marketplace use. The quotes below illustrate this.

We saw no benefit for the annual fee and event fee.  
---Low user, Pegasus

We don't see reverse auctions as the newest greatest way to sell products.  
---Low user, Pegasus

This discussion shows an organization's perceived value from marketplace use drives an organization's marketplace use. This is in line with previous IOIS research. Crook and Kumar's (1998) EDI case studies link system benefits to EDI use. Premkumar et al.'s (1994) survey links relative advantage to EDI diffusion stages. Tabor et al.'s (2001) case study links relative advantage to B2B EC use. Grewal et al.'s (2001) survey links efficiency motivations to B2B e-marketplace use.

#### **9. 4. ORGANIZATIONAL CAPABILITIES**

Different organizations have different capabilities. The field notes indicate an organization's capabilities affect their perceived value from marketplace membership. For buying organizations relevant capabilities include procurement systems and supplier pricing. Organizations with advanced procurement systems and well-developed supplier relationships will perceive less value from the marketplace. For selling organizations relevant capabilities include customer relationships. Selling organizations with strong customer relationships and automated ordering systems perceive less value from marketplace use than selling organizations trying to build market share and/or selling organizations without automated ordering systems.

For NTX we interviewed three carriers, two members and one nonmember. Each carrier was a large trucking company. The trucking companies all had automated processes in the form of preexisting logistics programs to facilitate efficient truck routing. The carriers also had sales staff to develop relationships and build business. Because of these existing capabilities, none of these carriers perceived a value from

using NTX. R.E. Transport joined because their existing customers wanted to do business via the marketplace. Southwestern Trucking joined to secure a customer. Each of the carriers noted that e-marketplaces did not emphasize their strengths and only evaluated them on price. The quotes below illustrate this.

At R.E. Transport we like to stress our strengths, that we are R.E. Transport, we have a large capacity, and we have the ability to react when our customers need something. We don't like competing with second-rate carriers. On the marketplace, these carriers may bid for the business and not really have the capacity or do as good of job as us.

---High seller, NTX

NTX's President is locked to this vision of people going out and putting their loads on the marketplace and then the trucking companies going out and looking for the loads and picking them up. We don't do business that way. I can't dedicate someone to sit in front of a computer and pick up loads. We do things with contracts and repetitive business and lanes.

We have a great system. Southwestern knows where they are going everyday.

---Low seller, NTX

The carriers further noted that independent trucker or trucking companies without an external sales staff would benefit from NTX. They said these smaller truckers didn't have the customer relationships they had and NTX could help fill their trucks.

Using these marketplaces may be better for companies just getting started or the ones that don't have the reputation we have.

---Low seller, NTX

The majority of the carriers that use NTX are truckers that hauled something somewhere and they are then in a truck stop looking at screens to backhaul something to their origin.

---Nonmember, NTX

We interviewed two organizations procuring freight via NTX. Both organizations achieved better freight pricing by using NTX. However, both

organizations were small. Each was a single-warehouse operation. In addition the organizations shipped non-perishable, non-refrigerated items. Leading Edge Brands shipped rootbeer. Texas Plastics shipped trash bags. We interviewed one buying organization that chose not to participate in NTX. McMurray Foodservice supplies restaurants and ships primarily perishable products with a 1-2 day shelf life. McMurray Foodservice has distribution centers throughout the United States. Because they represent repeat business and significant volume, McMurray Foodservice negotiates great carrier rates. The quotes below illustrate that buying organization capabilities affect the organization's perceived value from marketplace use.

Carriers have to go through a fairly detailed certification process to do business with us. This includes insurance, service, and driver training. For a carrier to do business with us, they must be compliant with our technology. In this situation, the option of using spot carriers goes away. Most of our business is lane specific and repetitive.

---Nonmember, NTX

This (NTX) may work for the small mom and pops and allow them to get better pricing. If a small mom and pop called Southwestern and wanted Southwestern to haul for them, they wouldn't get a discounted price because they didn't represent very much business. When these mom and pops go through a broker or something like NTX, they can get a better price because the broker, NTX, represents a lot of business.

---Low seller, NTX

Pegasus had a difficult time getting utilities to use the marketplace. Pegasus' original business model was based on utilities conducting all of their business via the marketplace. The problem was that many utilities had better supplier relationships than the Pegasus marketplace. Many utilities had been doing business with the same industry suppliers for years. In addition, most buying utilities had automated procurement systems for routine purchasing from their industry suppliers. The following quote illustrates that organizational capabilities affect an organization's perceived value from marketplace use, which then affects the organization's marketplace use.

In a lot of cases Gulf Coast Energy isn't using Pegasus' offerings because we are already there with lots of pricing and processes and Pegasus cannot really help us.

---High buyer, Pegasus

Pegasus also had a difficult time getting industry suppliers to join and then use the marketplace. Industry suppliers already had relationships with Pegasus' buying organizations so they did not perceive a benefit from joining Pegasus. Most industry suppliers that did join, did so at their buying utility's request. Suppliers with a large market share or suppliers with a virtual monopoly on a product were less likely to respond favorably to a utility's request to do business over the marketplace.

The selling organizations that perceived value from using Pegasus were primarily organizations that were trying to build industry relationships and/or organizations without automated ordering systems integrating with industry buying organizations. Office Plus is a high seller within Pegasus. They explained their motivation for using Pegasus was to build customer relationship with the utility industry. The quotes below illustrate that organization capabilities affect an organization's perceived value from marketplace use, which then affects the organization's marketplace use.

The big suppliers, the ones that have the business, have no reason to participate in Pegasus. In addition, most of these suppliers are already doing electronic commerce. They have the infrastructure where we can go online and place orders. Pegasus doesn't help them any.

---High buyer, Pegasus

The suppliers that do well on Pegasus, the ones that have been successful, are the ones trying to get into the market. We are working with a supplier that is new and has just installed a new ERP (Enterprise Resource Planning) system. They are planning to send everything through the marketplace. This makes sense for them since they are just starting out.

---Sales Vice President, Pegasus

The findings that the better an organization's capabilities are the less likely the organization is to perceive marketplace value and use the marketplace, is contrary to existing IOIS research. Several IOIS studies find information technology capabilities facilitate IOIS diffusion, particularly IOIS use. Crook and Kumar's (1998) qualitative study finds organization's information technology capabilities facilitate EDI use. Damsgaard and Lyytinen's (1998) field study links an organization's infrastructure to EDI diffusion. Grewal et al.'s (2001) survey of members in the Polygon marketplace links emphasizing information technology capabilities to organizations functioning effectively in B2B e-marketplaces. Hope et al. (2001) links current technology to B2B EC diffusion. Tabor's (2001) case study of a major U.S. airline also links technology performance to B2B EC use.

## **9.5. USER BUY-IN**

The data indicate user buy-in drives an organization's B2B e-marketplace use. User buy-in is whether the organization's intended marketplace users want to do business via the marketplace. The data indicate who made the organization's marketplace membership decision and whether marketplace use helps users achieve existing performance measurements affects user buy-in.

Table 16 shows users made selling organizations' marketplace membership decisions and management/corporate made buying organizations' marketplace membership decisions.

**Table 16 Marketplace Membership Decision Makers**

DECISION MAKER	NATIONAL TRUCKING EXCHANGE (NTX)	PEGASUS
Management/ Corporate	HB, LB (Texas Plastics, Leading Edge Brands)	2 HB, 3 LB (Synergy, Gulf Coast Energy (unregulated), Gulf Coast Energy Regulated, Lone Star Utilities, U.S. Electric and Power)
User	LS (Southwestern Trucking, Inc.)	1 HS, 2 LS (Office Plus, Bearing Point Manufacturing, Mining Manufacturing)

**Key:** The table categorizes user organizations by their use level (high vs. low) and how they use (sell vs. buy). This results in the classifications below.

HS-high seller, LS-low seller, HB-high buyer, LB-low buyer

In the low selling organizations, the organization's customer or potential customer wanted the selling organization to do business with them over the marketplace. The customer/potential customer communicated this with the selling organization's field sales representative. The field sales representative then went to their organization with the request and pushed the organization to do business with the customer/potential customer via the marketplace. In these cases, the organizations met the request and participated to the extent the customer wanted.

In the high selling organization, the organization's sales representative made the organization's marketplace membership decision. In this situation, a utility contacted Office Plus' National Sales Manager about doing business with the utility over Pegasus. Office Plus' National Sales Manager's performance metrics are based on increased sales. Doing business with this utility over Pegasus helped the sales representative increase sales. Once Office Plus joined Pegasus, their various sales representatives began

soliciting all the member utilities' business. Since the sales representatives made the decision for Office Plus to join Pegasus and Pegasus helped the sales representatives achieve their performance objective of higher sales, Office Plus achieved user buy-in and high use. The following quote illustrates this.

Office Plus thought that being a member of Pegasus would give us a leg up with the utilities. When we did our sales calls it would bring us into the utilities at a higher level than otherwise. Being in Pegasus gave us a recommended license to hunt. By joining Pegasus we got credibility and it made the utilities give us a more serious look at a higher level.

---High buyer, Pegasus

None of the selling organizations in Table 16 noted a problem with user buy-in. The field data indicate this is probably because users made the marketplace membership decision and marketplace membership helped users achieve their existing performance objectives of increased sales.

Table 16 indicates management/corporate made the buying organizations' marketplace membership decisions and then pushed marketplace use down to the users. The two NTX buying organizations had immediate user buy-in. The users adopted NTX and immediately started using. Four of the five Pegasus buying organizations mentioned lack of user buy-in as a marketplace use inhibitor. See Table 17.



**Table 17 Buying Organization Quotes Mentioning Struggling with User Buy-in**

ORGANIZATION	QUOTES MENTIONING STRUGGLING WITH USER BUY-IN
Gulf Coast Energy (Regulated)	It is hard pushing doing business via an electronic marketplace out to our employees.
Gulf Coast Energy (Unregulated)	<p>What would happen is I would talk to a supplier about doing business with us via Pegasus and then the supplier would call the buyer and say what is going on with wanting us to do business over this marketplace? The supplier would call the buyer and the buyer would basically call me. So there was not communication or power between our efforts with Pegasus and the purchasing departments. We would try to move the suppliers with Pegasus, but couldn't get the support of purchasing.</p> <p>When Pegasus tried to engage suppliers to be part of Pegasus, the suppliers would contact the people in the supply chain that were purchasing items from Pegasus. When the supplier said that Pegasus says you want to do business this way, the supply chain people at Gulf Coast Energy would shrug their shoulders and say we know nothing about it.</p> <p>I was the only one with performance metrics related to Pegasus.</p>
Lone Star Utilities	The buyers believe Pegasus will make their doom. They won't try and make it work.
U.S. Electric and Power	<p>Director Strategic Procurement/Supply Chain: The financial group at U.S. Electric and Power made the decision (to participate in Pegasus). This was a time when our company was looking for things to invest in. And, they made the decision purely as an investment, as a revenue generator. Then they pushed the decision down to the supply chain group and told us to try and find some things to use the marketplace for.</p> <p>We're in a marketplace that is actually a competitor of Pegasus. We're using it as a learning tool.</p> <p>Hope: Who made the decision to participate in this other marketplace?</p> <p>Director Strategic Procurement/Supply Chain: Me and the Senior Vice President of Procurement.</p>

Why did the two buying organizations participating in NTX achieve user buy-in, while the buying organizations participating in Pegasus struggled to achieve user buy-in? Using NTX helped both users in the study achieve their existing performance metrics of reducing freight costs. In addition, NTX's use helped with other performance metrics

because NTX made the users more efficient. Rather than calling several carriers to procure freight, NTX's users could post the load on the website.

Pegasus' adopting utilities struggled persuading their users to buy-in to Pegasus. Pegasus' initial offering did not help utility buyers achieve their existing performance metrics. For most products, Pegasus' marketplace was not as efficient as existing purchasing systems and using Pegasus took time to learn, which then took time away from achieving existing performance metrics. The following quote explains the relationship between existing performance metrics and utility user buy-in.

Performance metrics for buyers in utilities are still not clear with the use of marketplaces.

---Buyer Development Manager, Pegasus

The utilities that use Pegasus the most modified their buyers' performance metrics to encourage Pegasus' use. The following quote illustrates this.

The companies that have operational alignment with us know the strategic agenda, 1+1=3. We have a deep business unit relationship with them. The success metrics for their companies are inclusive of Pegasus.

---Sales Vice President, Pegasus

In addition to not helping achieve existing performance metrics, management/corporate making the utility's marketplace membership decision and pushing it down also hurt user buy-in. In some cases, management did not communicate to the buyers that they were supposed to use the marketplace nor did they show them how to use the marketplace. In other instances, the users felt threatened by the marketplace and wanted to prove that they could attain better pricing than the marketplace. The quotes below illustrate this.

The customer wants us to do something so we join the marketplace. What has been interesting is there is this real big deal and the customer wants to do it, we do join, we help the customer do sales presentation to their users, and then nothing happens. There is a disconnect between what the customer's corporate office wants to do and what the people out in the field do. They sign up because corporate wants to do it but then the company's buyers keep doing it the old way. I think they don't like to change.

---Low seller, Pegasus

Hope: Why do organizations get involved in a marketplace and then not use it?

Vice President of Strategic Accounts: This happens when the decision to join a marketplace is not made at the procurement level. So, when the procurement people find out that the organization has joined a marketplace they feel threatened, like the organization doesn't think they are doing their job. So, they will do anything they can to undermine the marketplace. They think that the marketplace is going to put them out of a job. I deal with procurement people who are trying to undermine marketplaces. Their procurement manager will call me in and say, hey our company joined this marketplace. Is there any way you can look at the contract and show that the marketplace isn't giving good prices? Of course, I'll give them a better price every time. The catch 22 is when Office Plus is in the marketplace and they then call me in. I still pat the local sales guy on the back and offer a better price. This is the "not invented here mentality." Procurement people will spend a year trying to undermine the marketplace. In the current economy, it is especially hard to get buyers to use marketplaces because they are scared they are going to lose their jobs.

---High seller, Pegasus

The IOIS studies in the review do not mention user buy-in as an IOIS use driver.

## 9. 6. CONCLUSION

This chapter examines organization characteristics driving an organization's marketplace use. Situations where organizations join marketplaces and then don't use them formed this research question. To investigate this question, we interviewed three

marketplaces, buyers and sellers participating in each marketplace, and at least one organization that chose not to participate in the marketplace. We coded the data into categories. We then analyzed the data to determine what organizational characteristics distinguish high users from low users.

Figure 12 shows the investigation's results. Figure 12 proposes membership motivation, perceived value from marketplace use, and user buy-in affect an organization's marketplace use. The model indicates membership motivation, perceived value from marketplace use, and user buy-in can overlap. We observed three cases (Office Plus, Leading Edge Brands, and Texas Plastics) in which the organization joined the marketplace because of a perceived value and immediately achieved user buy-in. In all three situations, the organizations immediately began using the marketplace. The model further proposes an organization's capabilities affect perceived value from marketplace use. The better an organization's supplier or customer relationships and/or the more automated the organization's processes, the less likely an organization is to perceive value from marketplace use and then use the marketplace.

#### 9.6.1. Comparison to Original Model

The original model (Figure 8) posits top management support, champion existence, and adequate resources impact an organization's B2B e-marketplace use. We designed the interview guides (see Appendix A) to solicit structured responses regarding the degree of these drivers' presence in each organization. Giving us greater insight, the respondents often elaborated on their responses to the structured questions. We also asked open interview questions. During the open interviews top management support, champion existence, and adequate resources were rarely mentioned.

In an effort to determine how these drivers affect an organization's B2B e-marketplace use, we compare the level of each of these drivers to the organization's use level. See Table 18. Based on the structured and the unstructured portion of the interviews, we did not include any of these drivers in the final model of organization characteristics driving marketplace use. The results indicate these drivers are minimum criteria necessary to achieve marketplace use, but their presence does not strongly

impact an organization's marketplace use. In the paragraphs below, we discuss each proposed driver.

**Table 18 Analysis of Original Marketplace Use Drivers Model**

	ORGANIZATION USE LEVEL	TOP MANAGEMENT SUPPORT	CHAMPION EXISTENCE	CHAMPION'S STATUS	ADEQUATE FINANCIAL RESOURCES	ADEQUATE TIME
NATIONAL TRUCKING EXCHANGE (NTX)						
R.E. Transport	High seller	2	2	N/A	5.5	5.5
Southwestern Trucking, Inc.	Low seller	7	1	Medium	3	2
Texas Plastics	High buyer	7	7	High	7	7
Leading Edge Brands (2 interviews)	Low buyer	7	7	High	7	7
PEGASUS						
Office Plus (4 interviews)	High seller	7	7	Low	7	7
Mining Manufacturing	Low seller	6	No champion	N/A	6	6
Bearing Point Manufacturing	Low seller	7	2	High	7	6
Synergy	High buyer	5	5	High	7	7
Gulf Coast Energy (Regulated)	High buyer	5	5	High	4.25	5
Gulf Coast Energy (Unregulated)	Low buyer	1	1	Medium/Low	7	5
Lone Star Utilities (2 interviews)	Low buyer	7	7	High	5	4.25
U.S. Electric and Power	Low buyer	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
C-STORE EXCHANGE (CSX)						
Momentum Manufacturing	Low seller	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
McMurray Distributing, Inc. (3 interviews)	Low seller	2	7	High	6	6
McMurray Distributing, Inc. (3 interviews)	Low buyer	2	7	High	6	6
Gulf Coast Oil	Low buyer	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable

**Key:** The table reports response to Likert scale questions. 1 indicates not at all. 7 indicates very much.

#### 9.6.1.1. Top Management Support

The original model proposes top management support drives an organization's marketplace use. Top management support refers to whether, in the period after deciding to participate in the B2B e-marketplace, a participant organization's management favors the organization using the marketplace. We asked the following question to solicit information regarding top management support.

- With 1 being not at all and 7 being very much so, in the periods after they decided to join the marketplace and once the marketplace became available for use, to what extent would you say top management favored your organization using the marketplace?

Table 18 shows the use level for each marketplace's member organizations and the degree of top management support within each member organization. The table shows mixed results for relationships between top management support and an organization's marketplace use. The table shows high responses for top management support and high and low organization use levels. The table also shows low responses for top management support and high and low organizational use level. Gulf Coast Energy (unregulated) and McMurray Distributing both had low responses for top management support, and as expected, achieved low use. R.E. Transport had a low response for top management support, but achieved high use. The following field note excerpt indicates business partner encouragement was a stronger organization use driver for R.E. Transport than top management support.

Top management did not want to do business over the marketplace. We were pushed by our trading partners.  
---High seller, NTX

The field data indicate top management support ebbs and flows with the environment and the organization's perceived value from marketplace use. For the most part, top management made the marketplace membership decisions. See Table 16. These decisions were made at the height of the EC boom. At this time, top management made the decision to join and then supported the marketplace. When the environment stopped encouraging EC initiatives and organizations were struggling to achieve use and value from their e-marketplace endeavors, top management support diminished. The quotes below illustrate this.

Earl (the Chief Executive Officer) got involved in CSX because McMurray Distributing thought they needed to do something about e-business, but it hasn't taken off like they thought it was. Earl really isn't seeing value so is unwilling to continue to invest in it.

---Low seller and buyer, CSX

No one in top management has “actively pushed” Lone Star Utilities to use the marketplace. Yes, they favored Lone Star Utilities using the marketplace as long as it brings value, but they used the value proposition as a way out. If there was no value then they weren't in favor of it.

---Low buyer, Pegasus

Given the mixed results for top management support and organization use level, this research cannot posit top management support as a marketplace use driver. Perceived value from marketplace use drives an organization's marketplace use. If top management perceives a value, they will support marketplace use. If they do not perceive a value, they will not support marketplace use.

Several IOIS studies (Cox and Ghoneim 1996, Hope et al. 2001, Ramamurthy et al. 1999) link top management support to various IOIS diffusion aspects. In the sense that the findings indicate, independent of business partner encouragement, top management support is necessary to achieve marketplace use, the findings support the existing literature. The findings also expand the existing IOIS literature to use, a specific aspect of diffusion, and to marketplaces, a type of IOIS where top management support's effect on use has not been investigated.

However, the findings open up a question. Were these studies conducted in situations where IOIS use offered a perceived value? In some of the marketplaces, the organizations did not perceive a value from marketplace use. As such, the findings indicate an interrelationship between perceived value, top management support, and use with perceived value a strong use driver.

#### 9.6.1.2. Champion Existence

The original model proposes champion existence drives an organization's marketplace use. Champion existence refers to someone in the organization consistently

pushing for the organization to use the B2B e-marketplace. We asked the following questions to solicit information regarding champion existence:

- Did a particular individual play a critical role in getting your organization to use the marketplace?
- If so, how would you characterize this person's status in the organization? High, Medium, or Low?
- With 1 being not at all and 7 being very much so, to what extent would you say there has been one or more continuous strong advocates (champions) of the marketplace's use within your organization?

Table 18 indicates mixed results for champion existence as a driver of an organization's marketplace use. The table shows high and low champion existence scores and low use levels. However, every high user had a high champion existence score, except R.E. Transport. R.E. Transport's low champion existence score and high use level indicates that business partner encouragement may be a stronger use driver than champion existence.

Because of these results and the fact that champion existence was rarely mentioned except when we asked the structured questions indicate, we cannot posit a relationship between champion existence and an organization's marketplace use. We also gathered information on the champion's status. Table 18 does not indicate a relationship between champion status and marketplace use.

Other researchers (Cavaye and Cragg 1995, Runge 1985, Runge 1988) have also investigated champion existence and are unable to find a strong link between champion existence and their dependent variable. Cavaye and Cragg (1995) find mixed support for champion existence in IOIS design and building. Runge (1985, 1988) is unable to



correlate champion existence with IOIS adoption even though his field notes mention champion existence a number of times.

#### 9.6.1.3. Adequate Resources

The model posits adequate resources drive an organization's B2B e-marketplace use. We define adequate resources as dedicating financial resources and time to incorporate the marketplace into the organization's existing processes. We asked the following questions to solicit responses about adequate resources:

- With 1 being not at all and 7 being very much so, to what extent would you say that adequate financial resources have been dedicated to getting the organization to use the marketplace?
  
- With 1 being not at all and 7 being very much so, to what extent would you say that adequate time has been allocated to programs associated with getting the organization to use the marketplace? These programs may include training people on the use of the system or programming time to integrate the marketplace into the existing procurement processes.

In evaluating the responses regarding adequate financial resources and adequate time, Table 18 indicates every organization except Southwestern Trucking had higher scores in these areas. Given that both high and low users had higher scores, adequate financial resources and adequate time do not appear to impact an organization's marketplace use. Rather, adequate financial resources and adequate time may be minimum criteria necessary for an organization to achieve high marketplace use.

#### 9.6.2. Research Implications

This research is one of the first investigations noting that organizations participating in the same B2B e-marketplace can achieve different use levels. The research is one of the first in-depth investigations of this phenomenon. The investigation

finds that membership motivation, perceived value, and user buy-in affect an organization's marketplace use. An organization's existing capabilities (relationships and automated processes) affect perceived value. These findings offer insights to the existing IOIS literature, as well as to a number of theories underpinning this literature. In this section we discuss the IOIS literature implications as well as the theoretical implications of this chapter's findings.

#### 9.6.2.1. Interorganizational Information Systems (IOIS) Literature Implications

As we discussed each of our study's findings in the chapter, we compared each finding with the existing IOIS literature. In the comparison, we recognized and cited other IOIS studies that agree with the particular individual findings in our study. Our literature comparison expanded to the IOIS literature, because very little e-marketplace research exists.

Two studies (Grewal et al. 2001, Premkumar and Ramamurthy 1995) somewhat corroborate our finding that an organization's e-marketplace adoption motivation affects their e-marketplace use. Premkumar and Ramamurthy's survey results indicate that firms proactively adopting EDI better integrate their EDI systems with other internal applications and more aggressively expand their external connectivity. Grewal et al. find firms emphasizing efficiency motivations and deemphasizing legitimacy motivations are more likely to develop substantial knowledge about their marketplaces and procedural knowledge about doing business on the marketplace.

Premkumar et al. and Grewal et al. studies used surveys. The surveys collected information on predetermined factors effect on a predetermined dependent variable. Surveys include many responses, increasing the generalizability of the findings. However, surveys collect information on predetermined factors and may not capture other factors that are even more relevant to the situation. Our study used a grounded theory method. Grounded theory involves in-depth case studies with a smaller number of organizations compared to surveys. As such, the findings may be idiosyncratic to the particular set of cases in the study.

The generalizability of the findings that adoption motivation affects use is increased because the three studies are in three different contexts, use two different research methods, and focus on two different IOIS types.

Our study recognizes three different e-marketplace membership motivations and shows that each motivation leads to different organization e-marketplace use levels. Grewal et al. do not recognize that organizations join e-marketplaces because their business partners encourage them to join. Premkumar and Ramamurthy's survey recognizes adoption motivations similar to our study but in an electronic data interchange context. This study shows that use transpires differently dependent on motivation. Premkumar and Ramamurthy ultimately group motivation into proactive and reactive. They do not show how the different aspects of a reactive motivation ultimately affect an organization's EDI use.

Several IOIS studies link different aspects of business environment change to various aspects of IOIS use. Sabherwal and Vijayasarathy's study (1994) links environmental uncertainty to telecommunications between customers and suppliers. Several EDI studies (Crook and Kumar 1998, Damsgaard and Lyytinen 1998, Premkumar and Ramamurthy 1995, Ramamurthy et al. 1999) link aspects of business environment change to aspects of EDI use. Ranganathan et al. (2001) link the external business environment to B2B EC deployment. Our study finds that many organizations joined e-marketplaces because the business environment was encouraging e-marketplace adoption. However, these organizations would not extensively use the e-marketplace unless they perceived that e-marketplace use offered their organization a relative advantage. In many cases, senior management decided to join the e-marketplace and when the workers tried to use it, the e-marketplace did not help them achieve their performance objectives. The other IOIS studies probably do not recognize this because most used surveys and the surveys were not designed to capture this information.

Crook and Kumar's (1998) grounded theory EDI study corroborates our finding that an organization's business partner encouraging the organization to use an IOIS facilitates an organization's e-marketplace use. However, our finding further shows that

organization's that join e-marketplaces for this reason only use the e-marketplace to the extent their requesting business partner requires. Neither Crook and Kumar's study nor the existing IOIS literature recognize this. This may be because other IOIS are point-to-point connections between two organizations. In these types of connections, an organization does not have the same opportunity to further use the IOIS as in e-marketplaces.

Several IOIS studies (Crook and Kumar 1998, Grewal et al. 2001, Premkumar et al. 1994, Tabor 2001) support our finding that an organization's perceived value from marketplace use drives an organization's marketplace use. However, our data indicate that business partner encouragement may be a stronger use driver than an organization's perceived value. R.E. Transport implemented and extensively used NTX even though the organization did not perceive a value from the marketplace.

This study's finding that organizational capabilities are negatively related to perceived value from e-marketplace use is contrary to the existing IOIS literature. This study defines organizational capabilities as existing relationships and automated processes. Many studies (Crook and Kumar 1998, Damsgaard and Lyytinen 1998, Grewal et al. 2001, Hope et al. 2001, Tabor 2001) of a variety of IOIS types link better organizational information technology capabilities to IOIS use.

This may be explained by considering the life cycle of IOIS connections. EDI was one of the first IOIS. When organizations implemented their first IOIS connections, they were comparing the perceived value from IOIS connections to their existing systems. These systems did not involve interorganizational information technology connectivity. Given this, the organizations with better technology capabilities would be better able to implement interorganizational connectivity. However, as years have passed many organizations have refined their interorganizational information systems connections. The decision to use e-marketplaces therefore involves evaluating existing interorganizational connections against e-marketplace connections. The organizations with strong interorganizational connections are unlikely to see many benefits from using e-marketplaces. Especially since at the time of this study, e-marketplace automation and

integration was evolving. Organizations without automated interorganizational connections perceived a value from e-marketplace use. These organizations are usually small, new, and/or less technically advanced companies than their counterparts.

The above explanation posits why our findings differ from the EDI studies. This explanation does not hold for studies of more recent IOIS implementations, including B2B EC (Hope et al. 2001, Tabor 2001) and e-marketplace (Grewal et al. 2001) studies.

Our study also identifies business partner relationships as an aspect of organizational capabilities. Our findings indicate that organizations perceive less value from using an e-marketplace to do business with organizations in which they have strong relationships. The existing IOIS literature does not recognize this. This is probably because one benefit of e-marketplaces is the ability to easily compare business partners. Previous IOIS did not have this benefit and as such previous IOIS studies would not have this finding.

This study indicates that user buy-in drives e-marketplace use. The study finds who made the decision to join the e-marketplace and whether using the e-marketplace helps users achieve their existing performance metrics affects user buy-in. The existing IOIS literature does not investigate user buy-in. Our study's contribution is introducing user buy-in to the IOIS literature.

#### 9.6.2.2. Theoretical Implications

In addition to providing implications to the existing IOIS literature, this study also provides implications to a number of theories underpinning the existing IOIS literature.

Resource dependency (Pfeffer 1988, Pfeffer and Salancik 1978) theory posits that an organization that is dependent on its trading partners will do what they ask to maintain the relationship with its trading partners. The findings support resource dependency theory by showing organizations that join marketplaces at their business partner's encouragement will only use the marketplace to the extent their trading partners require.

The findings also indicate that resource dependency theory may override innovation diffusion theory in explaining organizational marketplace use. Innovation diffusion theory (Rogers 1995) posits organizations will adopt technology they perceive offers a greater relative advantage than their existing systems. R.E. Transport indicated marketplace membership and use offered a very low relative advantage. However, R.E. Transport used the marketplace heavily. In addition, most of the other organizations that adopted marketplaces at their business partner's encouragement indicated no perceived value from marketplace use.

Institutional theory (DiMaggio and Powell 1983, Meyer and Rowan 1977) posits that organizations adopt practices that may not necessarily increase technical efficiency, but increase legitimacy in external stakeholders' eyes. This work supports institutional theory. The cases indicate several organizations joined marketplaces because everyone else was and Wall Street was encouraging organizations to have EC initiatives. However, the work shows that organizations adopting marketplaces for this reason will only use marketplace offerings that they perceive will help their organization. This extends institutional theory explaining that institutional theory may be limited to adoption and does not apply to use.

Innovation diffusion theory (Rogers 1995) posits organizations will adopt technology they perceive offers a relative advantage. The theory defines relative advantage as "an innovation being better than the idea it supersedes" (p. 212). The work supports innovation diffusion theory by showing relative advantage as one motivation for organizations adopting B2B e-marketplaces. The work extends innovation diffusion theory by explaining that organizations may adopt innovations for a number of reasons, but organizational use is driven by the organization's perceived value from marketplace use.

Innovation diffusion theory identifies the following relative advantage subdimensions: "degree of economic profitability, low initial cost, decrease in discomfort, social prestige, savings in time and effort, and immediacy of the reward" (Rogers 1995, p. 216). The cases illustrate economic profitability in terms of reduced

costs or increased sales is the primary way organizations measure perceived value. See Table 15. In Office Plus' case, doing business with marketplaces took more time and effort and was more error prone than traditional business practices, especially when organizations adopted hosted arrangements. However, Office Plus was a high marketplace user. Both organizations purchasing freight via NTX mentioned that using NTX made their jobs more efficient. Rather than calling carriers for quotes, the organizations could post the bid on NTX's website. However, both organizations mentioned this only in passing and did not quantify the efficiency impact of this improved process. These cases may indicate economic profitability has greater weight as a relative advantage subdimension than a decrease in discomfort or savings in time and effort.

The discussion above shows that in some cases the existing literature and theories support our findings. These situations increase our findings' validity and extend the IOIS literature and theories to a different context, B2B e-marketplaces. In other situations, our findings conflict with the existing literature and theories. This section identifies and examines these situations, offering greater insight both to our study's findings and the existing literature and theories.

#### 9.6.3. Practical Implications

The research offers practical implications for marketplaces and organizations considering joining and trying to use e-marketplaces.

In deciding whether to join a B2B e-marketplace, organizations should evaluate the marketplace's value propositions' alignment with their existing capabilities and performance metrics. If organizations join marketplaces for reasons other than the marketplace's relative advantage, the organization will have difficulty using the marketplace. Organizations in the study joined marketplaces at membership fees of \$0, \$85,000, and over \$15 million. These are expensive fees if your organization cannot use the marketplace. Consider these questions in evaluating whether your organization will use the marketplace.

How does the marketplace's customer or supplier relationships compare to your organization's customer or supplier relationships? For marketplace buying organizations, if the marketplace has better relationships with suppliers than your organization, using the marketplace may help your organization achieve better pricing. For marketplace supplier organizations, if the marketplace represents customers your organization would like to gain, using the marketplace may provide entrée to these customers.

How does the marketplace's procurement processes compare to your organization's procurement processes? If the marketplace has more efficient procurement processes than your organization, then the marketplace is worth using as it will provide your organization value.

Does using the marketplace help the marketplace's intended users achieve their performance metrics? If it does, they are likely to buy-in to the concept and use the marketplace. If it does not, your organization will struggle convincing them to use.

Finally, listen to your ground-level people. If they bring the idea of joining a marketplace to your organization, it is because they see an immediate value and will therefore use the marketplace.

Marketplaces must consider our research. Marketplaces must design their marketplace's value propositions so that the marketplace's intended members will perceive value. Marketplaces may use a variety of ways to solicit membership, but the marketplace will not survive long-term unless the members perceive a value from marketplace use.

Marketplaces should identify the organizations their intended membership does not have strong relationships with, but would like improved relationships. Developing relationships with these organizations will improve the marketplace members' perceived value from marketplace use. Marketplaces should also identify industry processes that need automation and concentrate on offerings improving these processes. Finally, in addition to soliciting executive level support, develop offerings that help the marketplace users achieve their existing performance objectives.



#### 9.6.4. Future Research

In conducting this research, we found a number of areas worthy of future investigation.

Because we used field research, we were able to identify that different organizations achieve different B2B e-marketplace use levels and then propose several factors affecting an organization's marketplace use. This is based on interviews, participant observations, and external data from buyers and sellers participating in three B2B e-marketplaces. Survey research investigating these factors would make the propositions more generalizable. Survey research in this area is possible because the organization is the unit of analysis. A researcher would be able to send out enough surveys to achieve a large enough response rate to determine how these organizational characteristics distinguish high users and low users.

What are the side benefits of marketplace use? The research indicates most organizations measure their marketplace benefits in terms of reduced product costs or increased sales. A few marketplace members noted that because their organizations decided to join the marketplace their department got funding to upgrade systems, improve processes, and update item lists. Several of the respondents noted using the marketplace to gather pricing information and then using this information to negotiate with their existing business partners. Others explained that marketplace use made their jobs more efficient. What are the side benefits of marketplace use? How do we measure these benefits?

The model posits that organizational capabilities affect perceived relative advantage, which then affects an organization's marketplace use. Some of the field data indicate that organizational size may affect organizational capabilities and perceived value from marketplace use. How does an organization's size affect an organization's capabilities, perceived value from marketplace use, and marketplace use?

## CHAPTER X

### CONCLUSION

In the 1990s corporate America discovered the Internet and its ability to connect multiple buyers and sellers. Fueled by consultants, analysts, Wall Street, and the trade press, organizations became very excited about the potential of business-to-business (B2B) electronic marketplaces (e-marketplaces) to revolutionize business by increasing efficiencies, reducing costs, and increasing sales. This excitement led to a frenzy of e-marketplace initiatives. One analyst predicted that “there were between 600 and 1,000 B2B e-marketplaces in 2001 and that there would be 4,200 by 2003” (Tumolo 2001).

Organizations have invested significant research and development in B2B e-marketplaces. The enabling technology is widely available. Yet, despite the early enthusiasm, most e-marketplaces have failed and most e-marketplace members only use e-marketplaces on a limited basis (Bannan 2001, Clark 2001, Gullledge 2002). As such, this dissertation identifies and investigates two critical challenges to e-marketplace success: achieving membership and marketplace utilization. The specific research questions are:

- What drives B2B e-marketplace membership?
- What marketplace characteristics drive B2B e-marketplace use?
- What organizational characteristics impact an organization’s B2B e-marketplace use?

Since very little research addresses B2B e-marketplace implementation, qualitative research using a grounded theory approach is the most appropriate way to investigate these questions. Data collection included participant observations, unstructured interviews, structured interviews, internal document reviews, and external document reviews. The field research spanned from August of 2000 through May 2003.

This time period included the early stages of the electronic commerce (EC) boom, the EC boom, the EC bust, and stabilization.

The research included a theoretical sample of e-marketplaces and participant organizations. Theoretical sampling involved selecting cases that provide contrasting evidence on the research question. The theoretical sample included four e-marketplaces; each with different outcomes in terms of membership levels and use levels. Within each e-marketplace, the theoretical sample included different types of organizations as well as organizations with different use levels. The research design included a high seller, a low seller, a high buyer, a low buyer, and a nonmember.

Using line-by-line analysis, advocated in grounded theory, we assimilated insights from nearly fifty executives involved in B2B e-marketplaces. This analysis resulted in three research models explaining factors influencing each research question.

Research model 1 explains what factors influence B2B e-marketplace membership. The field investigations indicate organizations join e-marketplaces for three reasons. These are: perceived relative advantage, perceiving the e-marketplace as a mechanism for dealing with a changing business environment, and business partner encouragement. Perceived relative advantage must be currently realizable to “in-power” organizations. Communicating the e-marketplace’s relative advantage and the business environment change and influencing member organizations to use the marketplace takes time. As such, marketplaces must develop complementary services to support continued existence. The e-marketplace’s drivers must be communicated. Relationships, industry promoters, and education drive communication. Industry competitive nature affects relationships.

Research model 2 explains what marketplace characteristics drive a B2B e-marketplace’s use. The field investigations indicate perceived relative advantage drives B2B e-marketplace use. Customizing to existing industry practices, supporting low-leverage procurements, fee structures, and reporting price/sales benefits drive an e-marketplace’s perceived relative advantage. Investor commitment and support drive both perceived relative advantage and use. Investor commitment is defined as the

founding organizations making efforts to use the marketplace and/or providing the marketplace feedback to enable member marketplace use. Support is defined as assisting member organizations with e-marketplace use.

Research model 3 explains what organizational characteristics impact an organization's B2B e-marketplace use. The field investigations indicate membership motivation, perceived value from marketplace use, and user buy-in affect an organization's marketplace use. Membership motivation, perceived value from marketplace use, and user buy-in can overlap. In three cases, organizations joined the e-marketplace because of a perceived value and immediately achieved user buy-in. In all three situations, these organizations immediately began using the marketplace. The model further proposes an organization's capabilities affect perceived value from marketplace use. The better an organization's supplier or customer relationships and the more automated the organization's processes, the less likely an organization is to perceive value from marketplace use and then use the marketplace.

## **10. 1. CHAPTER INTERRELATIONSHIP**

Information systems success is one of the most commonly investigated areas in the information systems field. The information systems literature (Delone and McLean 1992) posits a number of success definitions, success measures, and success drivers. B2B e-marketplace success has yet to be formally defined. Potential definitions may include financial viability or continued existence. Achieving membership and influencing members to use the e-marketplace is necessary to achieve this definition of e-marketplace success.

The existing information systems literature does not posit membership as a success criterion. Most of the existing information systems research focuses on information technology implementation in a single department, a single organization, or between two organizations. These information technology implementations do not require that organizations become members of the initiative. B2B e-marketplaces

require a number of organizations join the e-marketplace. As such, achieving membership is an initial criterion for e-marketplace success.

Use is one of the most common dependent variables in information systems research (Delone and McLean 1992). This research investigates two dimensions driving use. These include marketplace characteristics making e-marketplace use viable for all marketplace members and organizational characteristics driving an organization's marketplace use.

As success drivers, membership and use interrelate. As e-marketplace membership increases, the chance of some organizations using the e-marketplace increases. Organizations using the marketplace cause the environment to change. Other organizations observe this change and perceive joining the marketplace as a mechanism for dealing with the environment change. These organizations then explore the marketplace's relative advantage, and potentially use the marketplace.

Pegasus' Sales Vice President explains the interrelationship of marketplace membership and use as a chicken and egg problem. The e-marketplace must have member organizations for the marketplace to be used, but organizations won't join unless the marketplace is being used. Use level and number of participants follow one another. NTX, the marketplace with the highest use level, has the highest number of participants. Retail Matrix, the marketplace with no use, has the fewest participants.

The following excerpts illustrate the interrelationship of marketplace membership and use.

The problems were hesitancy of the industry players to join because we didn't even have a base of real players that could conduct any kind of transaction.

---Senior Vice President of Strategic Alliances,  
United States Convenience Store Association

It was a catch 22. Until they used the community was not going to get big.” “When we talked to the other companies to get them in, they would say well your investors aren’t using it why should we? This is the same thing the analysts said.

---President and Chief Operating Officer, CSX

The interrelationship of membership and use is in line with **critical mass theory** (Granovetter 1978, Granovetter 1985, Markus 1990). Critical mass theorists posit collective action participation decisions are based on perceptions of what the group is doing, who participates, how many participate, and contributions to date.

The investigation indicates aspects of perceived relative advantage drive e-marketplace membership, e-marketplace use, and an organization’s e-marketplace use. An organization may join an e-marketplace for a variety of reasons, but extensive organizational use arises when the organization’s decision makers perceive e-marketplace use helps the organization achieve its operating objectives. As such, perceived relative advantage is critical to e-marketplace success.

## 10.2. CONTRIBUTIONS

This research contributes to practice, the IOIS literature, and theory.

### 10.2.1. Contributions to Practice

This research offers practitioners objective insight into e-marketplaces and their role within industries and within their organization. First, the research provides insights into designing an e-marketplace that will add value by improving existing industry operations. Second, the research identifies several strategies marketplaces can use to attract members. Third, the research helps organizations evaluate e-marketplace membership opportunities and join e-marketplaces that will improve their business operations. Finally, this research gives organizations insight into motivating their employees to use the e-marketplace.

### 10.2.2. Contributions to the Interorganizational Information Systems (IOIS) Literature

In 1987, Malone et al. predicted that with the availability of information and communication technologies, electronic markets would become the favored mechanism for coordinating the flow of goods and services. Even though the electronic markets hypothesis is now sixteen years old, most of the literature anticipates the impacts of these e-marketplaces and does not investigate factors contributing to their adoption and use.

This research is one of the first in-depth data-driven B2B e-marketplace inquiries. The research identifies two challenges to the widespread acceptance of B2B e-marketplaces: achieving a critical mass of members and then influencing these members to use the e-marketplace. By investigating these challenges, this research promotes in-depth understanding of three aspects of B2B e-marketplaces.

- What drives e-marketplace membership?
- What marketplace characteristics drive e-marketplace use?
- What organizational characteristics impact an organization's e-marketplace use?

By comparing the findings from this study to the existing IOIS literature, this research shows adoption and use drivers that are similar to and different from the IOIS literature. The research then reconciles the difference between the findings, promoting a better understanding of both e-marketplaces and IOIS.

Most importantly, the research challenges existing notions and categorizations of e-marketplaces. Zwass defines an e-marketplace as a telecommunications network created to facilitate transactions between multiple buyers and multiple sellers (Zwass 1999, p. 10). Given this definition, most researchers (Choudhury 1998, Dai and Kauffman 2001, Grewal et al. 2001, Lee and Clark 1996a, Lee and Clark 1996b, Memishi 2001) conceptualize e-marketplaces as open trade where any buyer can buy from any seller and vice versa. This research shows that e-marketplaces are currently not as open as had been originally anticipated. The e-marketplaces in this study are primarily used to procure goods and services from a handful of existing business

partners, rather than shopping an entire market. In addition, trade does not occur purely over the e-marketplace. Transactions may culminate in a transaction over the e-marketplace. However, usually the transaction includes a variety of other communication mechanisms, including face-to-face, paper, telephone, etc. E-marketplaces may also be the impetus for a transaction that ultimately occurs using another trade mechanism such as electronic data interchange.

In e-marketplace studies, a number of authors (Andrew et al. 2000, Dai and Kauffman 2001, Kaplan and Sawhney 2000, Memishi 2001, Tumolo 2001) have developed schemes to classify e-marketplaces. This research challenges the notion of existing e-marketplace classification schemes. As we tried to classify the e-marketplaces in this study into relevant schemes, many of the e-marketplaces fell into multiple author proposed schemes or into no author proposed schemes. See Table 8. The dynamic nature of e-marketplaces explains the lack of fit between schemes and existing e-marketplaces. The e-marketplaces in this study evolved. When one business practice didn't work, the e-marketplaces tried others, continuously evolving in order to achieve a critical mass of users.

#### 10.2.3. Contributions to Theory

Chapters VII, VIII, and IX discuss the findings' theoretical implications. The findings have implications to a number of theories, including transaction cost economics, resource dependency theory, innovation diffusion theory, institutional theory, and the electronic markets hypothesis.

The findings indicate organizations join e-marketplaces for three competing motivations. In comparing these motivations to existing theory, innovation diffusion theory, institutional theory, and resource dependency theory each support a particular motivation for e-marketplace membership. No one theory explains why organizations join e-marketplaces. In addition, these existing theories do not address how an organization's membership motivation ultimately affects the extent the organization uses the e-marketplace. Chapter IX's findings address this. E-marketplace membership



motivation affects e-marketplace use and a particular organization's e-marketplace use. This supports and extends innovation diffusion theory to a B2B e-marketplace context.

As part of the electronic markets hypothesis, Malone et al. posit the electronic brokerage effect. This explains that buyers will establish e-marketplaces in order to maximize the number of alternative products and services available and the ease of comparing them. All of the original business models of the four e-marketplaces in our study were based on this premise. However, buyers would not extensively use e-marketplaces based on this premise because they value their existing supplier relationships and recognize that their suppliers offer many services (e.g., guaranteed in-stock, warehouse stocking) that cannot be contracted for in an e-marketplace setting. In addition, buyers depend on their supplier relationships especially when they need something extra from the supplier as part of unforeseen circumstances (e.g., fast delivery to rebuild electrical infrastructure damaged by inclement weather). The e-marketplaces in this study had to move away from the open e-marketplace predicted by Malone et al. to an e-marketplace supporting their existing relationships.

Furthermore, transaction cost economics also explains why the original implementations of open B2B e-marketplaces were unsuccessful in achieving extensive use. Open B2B e-marketplaces were based on the idea of the buyer shopping many suppliers to obtain the best deal. Most existing procurement practices are based on prenegotiated contracts and automated purchasing based on desired inventory levels. The transaction cost of shopping and comparing via an open B2B e-marketplace was more than the transaction cost of continuing to use existing automated procurement practices. Transaction cost economics explains why modifications to B2B e-marketplace business models (e.g., customizing to existing industry practices, supporting low-leverage procurements, and fee structures) have been successful in increasing e-marketplace use.

This research as a whole offers insights to Monge et al.'s (1998) public goods-based theory. Their theory of collective action in alliance-based interorganizational communication and information systems describes the process of

producing multi-firm, alliance-based interorganizational communication and information public goods. The B2B e-marketplaces investigated in this study are value chain alliances. Value chain alliances create information public goods to reduce transaction costs between buyers and sellers (Monge et al. 1998). Value chain alliances are the result of members investing in efficiency-producing information and communication systems that reduce coordination costs (Malone et al. 1987).

Monge et al.'s (1998) theory of collective action in alliance-based interorganizational communication and information systems does not consider power's role in the process of producing multi-firm, alliance-based interorganizational communication and information public goods. This research uncovers e-marketplace membership's contingency on the e-marketplace offering a relative advantage to "in-power" organizations. When "in-power" organizations join the marketplace, they then encourage their less powerful business partners to join. These less powerful business partners join because they depend on their powerful trading partners. The research finds organizations that join marketplaces because of their powerful business partner's encouragement will use the marketplace to the extent their business partner requires.

Monge et al.'s (1998) theory of collective action in alliance-based interorganizational communication and information systems does not consider the fad aspect of a public good as a driver of the good's creation. The research indicates many organizations joined the B2B e-marketplace because they viewed the marketplace as a mechanism for dealing with a changing business environment. Wall Street was encouraging marketplace membership and everyone else was initiating EC initiatives. The fad aspect seems to account for marketplace membership, but does not hold for marketplace use. Organizations will not use the marketplace unless the marketplace offers a perceived relative advantage.

As a whole, this research provides data-driven insight into three aspects of producing this type of alliance-based interorganizational communication and information public goods.

In some cases, existing theory supports this study's findings. In these situations, both the findings and the existing theory become stronger. This extends existing theory to another setting and increases the generalizability and internal validity of this study's findings. In some cases, this study's findings identify aspects not considered in the existing theories or conflicts with the existing theories. In these situations, we've tried to explain the new concept or the conflict. Identifying these differences gives greater understanding to the boundaries of existing theory and deeper insight into this study's findings.

### **10.3. LIMITATIONS**

This research has limitations. Some limitations are inherent in the method, while others are limitations of this study's application of the method.

Strauss and Corbin (1998) define a theory as a set of well-developed categories that are systematically interrelated through statements of relationships to form a theoretical framework that explains some phenomenon. The models in Chapters VII, VIII, and IX are theories derived from a bottom up approach of collecting and analyzing data in a variety of B2B e-marketplace settings and from a variety of B2B e-marketplace participants. The theories are not yet generalizable to a broad range of issues or phenomena. These theories speak specifically about the populations in which they were derived. These theories offer predictive power and explanations in similar B2B e-marketplace settings.

Eisenhardt (1989) suggests a theoretical sample of at least four cases in order to make comparisons and contrasts between the cases. We designed this study to include a theoretical sample of four e-marketplaces, four member organizations within each e-marketplace, and one organization that chose not to join each e-marketplace. Because two of the e-marketplaces in this study never achieved extensive use and ultimately failed, some comparisons were difficult. However, this outcome also made some comparisons stronger.

Grounded theory suggests using data collected through both participant observations and interviews. Our data consists of more interview data than observational data. This research involved high-level, in-demand, industry experts. In most cases, negotiating an interview with a single organization took months, and in a few cases this process took more than a year. In most situations, we were unable to negotiate observational access over an extended period of time. Deeper insights would have emerged had we been allowed to shadow the participants in our study or observe more meetings related to attracting members to the marketplace and then influencing the members' marketplace use.

Finally, we have not yet shared our findings extensively with study participants. The next step in this research is sharing this information with study participants and others involved in e-marketplaces. Sharing this information with and obtaining feedback from participants will make these findings stronger.

#### **10. 4. FUTURE RESEARCH**

This research investigates factors driving B2B e-marketplace membership, marketplace characteristics driving B2B e-marketplace use, and organizational characteristics driving an organization's B2B e-marketplace use.

B2B e-marketplace membership and B2B e-marketplace use are criteria for a successful B2B e-marketplace, with success defined as continued existence and/or financial viability. However, existing research does not define B2B e-marketplace success. Future research should define e-marketplace success. Other success aspects also warrant investigation. What is the relationship between staying power and success? What drives e-marketplace success? What causes e-marketplace failure? Answering these questions will help create successful B2B e-marketplaces. Answering these questions will close a gap in the literature and start a research stream for a type of information system requiring a critical mass of participants.

Defining critical mass is another area worthy of investigation. When we began this research, we asked the respondents about critical mass. The respondents had a very

difficult time explaining when their marketplace would achieve critical mass and what marketplace critical mass was. Since B2B e-marketplace viability requires membership and use from a critical mass of buyers and sellers, this area is worthy of investigation.

In 1987, Malone et al. (1987) developed the electronic markets hypothesis. The electronic markets hypothesis predicts that with the presence of electronic communication technologies, electronic markets will be the favored mechanism for coordinating material and information flows among organizations. Bakos followed this work in 1998 by defining the benefits of using electronic markets for product, price, and transaction cost. An interpretive study investigating how the B2B e-marketplaces in this study have evolved compared to Malone et al.'s and Bakos' prediction will yield further insight into the electronic markets hypothesis.

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## **APPENDIX A**

### **INTERVIEW GUIDES**

This section presents the three interview guides we used to conduct our research. The marketplace interview guide organized interviews with marketplace representatives. The participant organization interview guide structured interviews with organizations participating in the B2B e-marketplace. The nonmember interview guide structured interviews with organizations that had been asked to join a particular marketplace but turned the offer down, or organizations that joined but did not use the marketplace.

## MARKETPLACE INTERVIEW GUIDE

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### RESPONDENT INFORMATION

Date: \_\_\_\_\_ Interview Time: \_\_\_\_\_  
Interview Location: \_\_\_\_\_  
Name: \_\_\_\_\_  
Job Title: \_\_\_\_\_  
Company: \_\_\_\_\_  
Marketplace Name: \_\_\_\_\_

Do you wish for these names (your name, company name, marketplace name) to remain anonymous?

\_\_\_\_\_ Yes

\_\_\_\_\_ No

### PROJECT INFORMATION

1. What has been your role with the marketplace your company is involved in?
2. What is the business model and value proposition of the marketplace? (What is the marketplace supposed to do?)
3. Why was the marketplace formed?
4. How was the marketplace formed?
5. What companies are involved in the marketplace?
6. How did the companies become involved?

## MARKETPLACE INTERVIEW GUIDE CONTINUED

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7. Why did most of the companies join the marketplace?
8. What types of products/services are offered over the marketplace?

### CRITICAL MASS

9. How many of the following are members of the marketplace?  
☐ Buyers  
☐ Suppliers
10. How many did you originally anticipate needed to be part of the marketplace to achieve critical mass?  
☐ Buyers  
☐ Suppliers
11. At what rate has the marketplace been adopted by target participants?  
☐ not at all  
☐ slowly  
☐ moderately  
☐ rapidly
12. How will you know when the marketplace has achieved a critical mass of participants?

### USE

13. How does the marketplace measure marketplace use?
14. In the last 3 months, what has been the average use or number of transactions completed over the marketplace?
15. In the past 3 months, how frequently has the marketplace been used? (For example, 10 transactions/day, or we could look at number of connections per day)
16. How do you know how your marketplace is doing in terms of use? What standard do you use for comparison? Is there an average for marketplaces in the industry or marketplaces in general?



## MARKETPLACE INTERVIEW GUIDE CONTINUED

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### CRITICAL MASS FACILITATORS

#### *Marketing and Promoting the System*

17. With regard to the marketplace, how much attention was given to publicity, advertising, or promotion of any kind?
- \_\_\_\_\_ none
- \_\_\_\_\_ a little
- \_\_\_\_\_ a lot
18. What types of publicity, advertising, or promotion were used to make organizations that the marketplace would like to be members of the marketplace aware of the marketplace?
19. What percentage of organizations that the marketplace would like to be part of the marketplace have been contacted?
20. On a scale of 1 to 7 with 7 being very much so and 1 being not at all, to what extent would you say the marketplace has been adequately marketed and promoted to its intended participants?
21. On a scale of 1 to 7 with 7 being very much so and 1 being not at all, to what extent would you say that the marketplace's efforts with marketing and promotion have affected its outcome in regards to achieving critical mass? (Do you think there is a relationship between marketing and achieving critical mass?)
22. What other aspects of marketing and promotion have affected the marketplace's achievement of critical mass?

#### *Key Players*

23. What organization would you say are key in the industry, with key being defined as producing or consuming an industry good with limited competition and/or being in the top 25% in terms of annual sales compared to the rest of the industry?
24. How many of these organizations are participating in the marketplace?
25. How many are not?

## MARKETPLACE INTERVIEW GUIDE CONTINUED

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26. On a scale of 1 to 7, with 7 being very much so and 1 being not at all, to what extent would you say that the involvement or lack of involvement of key players affect the marketplace's outcome in regards to achieving critical mass? (Is there a relationship between key player involvement and achievement of critical mass?)

### *Industry Support*

27. Is an industry trade organization involved in getting the industry to join the marketplace?

☐ Yes

☐ No

28. On a scale of 1 to 7 with 7 being very much so and 1 being not at all, to what extent would you say that the involvement or lack of involvement of a trade organization has affected the marketplace's outcome in regards to achieving critical mass?

### *Ownership Structure*

29. What is the ownership structure of the marketplace?

☐ Independently owned with a governance process separate from the organizations involved

☐ Independently owned with a management team separate from the organizations involved

☐ Independently owned with both a management team and a governance process separate from the organizations involved

☐ Owned by industry players

☐ Other, if other explain:

30. On a scale of 1 to 7, with 7 being very much so and 1 being not at all, to what extent would you say that the ownership structure has affected the marketplace's outcome in regards to achieving critical mass? (Is there a relationship between ownership structure and critical mass?)

### *External Pressure*

31. When did most of the organizations join the marketplace?

32. On a scale of 1 to 7 with 1 being not at all and 7 being very much so, to what extent would you say that companies got involved in the marketplace because of what competitors were doing or intending to do in the same area?

33. On a scale of 1 to 7 with one being not at all and 7 being very much so, to what extent would you say organizations joined the marketplace because they felt they had to get involved in electronic commerce?

## MARKETPLACE INTERVIEW GUIDE CONTINUED

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34. What efforts did marketplace participants make to get their trading partners to join the marketplace?
35. What percentage of organizations got involved in the marketplace because their trading partners wanted them to/sponsored their involvement?

### *Open-ended*

36. What factors do you think most influenced the marketplace's results on critical mass?

## USE FACILITATORS

### *Compatibility*

37. With 1 being not at all and 7 being very much so, to what extent would you say that the participant organizations had to customize the marketplace's technology so that it seamlessly integrates with the participant organizations' information systems?
38. Of the organizations participating in the marketplace, what percentage have seamlessly integrated the marketplace's technology into their existing systems?
39. What are the differences between the marketplace's business practices and the existing industry business practices? (For example, is the marketplace based on price competition and the industry on long-term relationships?)

### *Uniform Standards*

40. Is there currently a standard way of describing products in the industry in which the marketplace operates ?  
 \_\_\_\_\_ Yes  
 \_\_\_\_\_ No
41. With 1 being not at all and 7 being very much so, to what extent would you say that there is a standard way of describing products in the industry in which the marketplace operates?
42. On a scale of 1 to 7 with 7 being very much so and 1 being not at all, to what extent would you say that uniform standards, or the lack of, has affected the use levels of the marketplace?

**MARKETPLACE INTERVIEW GUIDE CONTINUED**

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*Trust*

43. Would you say that the marketplace ensures that the promises made in transactions conducted via the marketplace are kept? (The promises refer to on time delivery, product quality)

\_\_\_\_\_ Yes

\_\_\_\_\_ No

44. On a scale of 1 to 7 with 7 being very much so and 1 being not at all, to what extent would you say that trust in terms of belief that the marketplace will ensure promises made in transaction conducted via the marketplace or the lack of has affected marketplace use levels?

*Open-ended*

45. What factors do you think most influence the marketplace's use levels?

## PARTICIPANT ORGANIZATION INTERVIEW GUIDE

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### RESPONDENT INFORMATION

Date: \_\_\_\_\_ Interview Time: \_\_\_\_\_

Interview

Location: \_\_\_\_\_

Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Company: \_\_\_\_\_

Marketplace Name: \_\_\_\_\_

Do you wish for these names (your name, company name, marketplace name) to remain anonymous?

☐ Yes

☐ No

### PROJECT INFORMATION

1. What is your company's share of the industry? Consider the industry the marketplace represents.

☐ Less than 10%

☐ 11-20%

☐ 21-30%

☐ 31-40%

☐ 41-50%

☐ 51-60%

☐ 61-70%

☐ 71%-and above

## PARTICIPANT ORGANIZATION INTERVIEW GUIDE CONTINUED

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2. What does your company use the marketplace for? Check all that apply.
  - ☐ Buy
  - ☐ Sell
  - ☐ Provide information
  - ☐ Gather information
  
3. What has been your role with the marketplace in which your company is involved?
  
4. What is the business model and value proposition of the marketplace in which your company is involved? (What is the marketplace supposed to do?)
  
5. When did your company get involved with the marketplace?
  
6. How did it come about that your company got involved in the marketplace?
  
7. Why did your company get involved with the marketplace?
  
8. With 1 being not at all and 7 being very much so, to what extent did your company get involved in the marketplace because:
  - ☐ of what competitors were doing in the area
  - ☐ your trading partners wanted you to get involved in the marketplace
  - ☐ your organization felt that they needed to do get involved in electronic business
  - ☐ the marketplace's offerings would improve the way your organization does business in terms of reduced supply chain costs, reduced product costs, or more business

### RESEARCH MODEL INFORMATION

9. How does your organization use the marketplace?
  
10. How does the marketplace measure your marketplace use ?

**PARTICIPANT ORGANIZATION INTERVIEW GUIDE CONTINUED**

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11. What types of transactions does your organization engage in with the marketplace?
12. By transaction type, in the past 3 months, what has been the average number of transactions your organization has:
- \_\_\_\_\_ completed over the marketplace
- \_\_\_\_\_ had facilitated over the marketplace (transactions other than those completed over the marketplace)
13. In the past 3 months, how frequently has your organization used the marketplace?
- \_\_\_\_\_ More than 10 times per day
- \_\_\_\_\_ Daily
- \_\_\_\_\_ A few times a week
- \_\_\_\_\_ Weekly
- \_\_\_\_\_ Monthly
- \_\_\_\_\_ Hardly ever
- \_\_\_\_\_ Not at all
14. With 1 being not at all and 7 being very much so, to what extent would you say your trading partners have assisted your organization in using the marketplace? In this case trading partners being the organizations your company does business with.
15. If your trading partners did assist your organization in using the marketplace, what type of assistance was provided?
- \_\_\_\_\_ Financial resources to join the marketplace
- \_\_\_\_\_ Financial resources to update technology
- \_\_\_\_\_ Training on the benefits of the marketplace
- \_\_\_\_\_ Training on how to use the marketplace
- \_\_\_\_\_ Advice on implementing the marketplace
- \_\_\_\_\_ Other, please specify:

**PARTICIPANT ORGANIZATION INTERVIEW GUIDE CONTINUED**

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16. With 1 being not at all and 7 being very much so, in the periods after they decided to join the marketplace and once the marketplace became available for use, to what extent would you say top management favored your organization using the marketplace?
17. With 1 being not at all and 7 being very much so, in the periods after they decided to join the marketplace and once the marketplace became available for use, to what extent would you say top management actively pushed your organization using the marketplace?
18. Did a particular individual play a critical role in getting your organization to use the marketplace?
19. If so, how would you characterize this person's status in the organization?
- \_\_\_\_\_ High
- \_\_\_\_\_ Medium
- \_\_\_\_\_ Low
- \_\_\_\_\_
20. With 1 being not at all and 7 being very much so, to what extent would you say there has been one or more continuous strong advocates (champions) of the marketplace's use within your organization?
21. With 1 being not at all and 7 being very much so, to what extent would you say that adequate time has been allocated to programs associated with getting the organization to use the marketplace? (These programs may include training procurement people on the use of the system, or programming time to integrate the marketplace into the existing procurement processes.)
22. With 1 being not at all and 7 being very much so, to what extent would you say that adequate financial resources have been dedicated to getting the organization to use the marketplace? (This may include consulting fees associated with integrating the marketplace into the organization's existing systems or external training fees.)

*Open-ended*

23. What factors do you think most influenced your organization's use of the marketplace?



## NONMEMBER INTERVIEW GUIDE

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### RESPONDENT INFORMATION

Date: \_\_\_\_\_ Interview Time: \_\_\_\_\_

Interview

Location: \_\_\_\_\_

Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Company: \_\_\_\_\_

Marketplace Name: \_\_\_\_\_

Do you wish for these names (your name, company name, marketplace name) to remain anonymous?

Yes

\_\_\_\_\_  
No

### PROJECT INFORMATION

1. Are you familiar with \_\_\_\_\_ marketplace?
2. How did you become familiar with \_\_\_\_\_ marketplace?
3. Is your company involved in a marketplace similar to \_\_\_\_\_ marketplace?
4. Why did your company choose not to adopt \_\_\_\_\_ marketplace?

## NONMEMBER INTERVIEW GUIDE CONTINUED

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5. To what extent would you say each of the following were true for \_\_\_\_\_ marketplace? With 1 being not at all and 7 being very much so. If you can't assess, put ca.

\_\_\_\_\_ Marketplace was adequately marketed  
 \_\_\_\_\_ Key industry players were participating in the marketplace  
 \_\_\_\_\_ Industry supported the marketplace  
 \_\_\_\_\_ Marketplace ownership structure was independent  
 \_\_\_\_\_ Marketplace offered participants advantages  
 \_\_\_\_\_ Competitors were participating in the marketplace

6. To what extent would you say each of the following influenced your company's decision not to adopt \_\_\_\_\_ marketplace? With 1 being not at all and 7 being very much so. Consider answer to question 5 in listing alternatives.

\_\_\_\_\_ Level of marketplace marketing  
 \_\_\_\_\_ Level of key industry player participation  
 \_\_\_\_\_ Level of industry support  
 \_\_\_\_\_ Marketplace ownership structure  
 \_\_\_\_\_ Level of marketplace advantages offered to participants  
 \_\_\_\_\_ Level of competitor participation in the marketplace

7. To what extent would you say each of the following were true for your organization? With 1 being not at all and 7 being very much so?

\_\_\_\_\_ At the time, we were already involved in a similar marketplace  
 \_\_\_\_\_ We felt the marketplace was going to lower our margins  
 \_\_\_\_\_ We felt the marketplace did not help our existing relationships with customers or suppliers

## **APPENDIX B**

### **CONFESSIONAL ACCOUNT OF GAINING ENTRÉE**

This research began in the fall of 2000. Corporate America had discovered the Internet a few years prior and was enamored with using the Internet in business. America was enjoying great prosperity. Investors were looking for investments and corporate America had extra money to explore new endeavors.

Many companies were exploring electronic commerce (EC). Almost weekly another company would announce an EC initiative. Wall Street was rewarding companies for EC initiatives and penalizing those without EC initiatives. As academics, we knew very little about EC and felt that the business world's EC knowledge was outpacing ours. For this reason, when I started my qualitative research class in the fall of 2000, I chose to study several companies' efforts in creating a business-to-business (B2B) electronic marketplace (e-marketplace) for the convenience store industry.

I chose CSX (C-Store Exchange) for my study because my husband was an executive at McMurray Distributing. McMurray Distributing was one of the four companies founding CSX. I thought with my husband's connections he would be able to get me access to do the study. This proved much more difficult than I thought. The convenience store industry is very competitive and at the time I started my study there were a number of convenience store industry marketplaces forming. Every CSX founding organization signed a non-disclosure agreement and any company CSX approached about joining also had to sign an agreement before CSX would talk to them about the marketplace. CSX's founders wanted to be sure none of their proprietary information was leaked to any of their competitors. In addition, they were in a rush to get the marketplace up and going so they could be the first one to market and the first one to go public. This created a very busy environment not conducive to talking with a student about the project. In addition, the McMurray Distributing executive in charge of CSX, who was also sitting on CSX's board of directors, was one of the top five executives at McMurray Distributing. McMurray Distributing has over 10,000

employees. He had a very busy schedule and this was a very busy time. Nevertheless, my husband got me access to him. I had five interviews and was able to observe one meeting during the fall of 2000. I had another interview in the summer of 2001. Because of my relationship with the organization, I stayed up-to-date on CSX.

After I defended my proposal in the spring of 2002, my husband went back to McMurray Distributing's CSX representative, Bob, and asked him to help me get interviews with all of CSX's members for my dissertation. Bob said he would help me get access to the rest of CSX's members, but that I needed to wait a while. He said CSX had just had a very hostile board meeting and one of the board members was moving for CSX's shutdown. In May and June of 2002, my husband got me interviews with three people within McMurray Distributing that were involved in CSX. My access to CSX's other board members was on-hold until Bob felt comfortable approaching the board. In October of 2002, CSX was shutting down. My husband again asked Bob to help me interview Longoria, the President and Chief Operating Officer of CSX. Bob said this was a good time. He called Longoria, Longoria called me, and I went to Alamo, California for the interview. Longoria was the President of CSX, but also a former long-term Gulf Coast Oil employee. During the interview, I got both the marketplace's perspective and Gulf Coast Oil's perspective for my research.

As of June 2003, I still need to interview Momentum Manufacturing and I have some questions to clarify with Gulf Coast Oil. Longoria introduced me to a lady at Gulf Coast Oil that did a learning look back study on Gulf Coast Oil's CSX investment. I contacted her in March 2003. She asked that I send her the questions I want to ask so she could take them to legal to see if she could talk to me. I called her back in May 2003, and she told me she hadn't heard back from legal, but would get back with me the next week and let me know something. I have still not heard from her. My husband is working with Bob to see if Bob will call the Gulf Coast Oil and Momentum Manufacturing board members and ask them to participate in my study.

My involvement with Pegasus began in December 2000. I was in the midst of my CSX study and one of my professors thought I should present my research to Texas

A&M's Center for the Management of Information Systems (CMIS). CMIS consists of businesses with a relationship with Texas A&M. I made the presentation and Lone Star Utilities was interested in the project. The CMIS member took the project back to Mark, the Lone Star Utilities person that could help me with my project. Mark called me to talk about the project and we hit it off. Part of it was that we were from the same area and had similar personalities. Mark was also an A&M graduate. My dissertation co-chairmen had taken Mark to dinner in the fall of 2000 when Mark was a guest speaker in a class. Mark remembered him. Mark's company, Lone Star Utilities, also takes an active interest in the community. Lone Star Utilities encourages their employees' community involvement. My dissertation co-chairmen, another student, and myself had an introductory meeting about the project in December of 2000. Ever since then, Mark has gone out of his way to help us with the project.

Between December of 2000 and December of 2001, we had eight lengthy visits with Mark learning about Lone Star Utilities' efforts with Pegasus. In the spring of 2001, Mark introduced me to Pegasus' portfolio manager. When I met the portfolio manager, Mark mentioned that I would like to talk with Pegasus about my study and the marketplace. The portfolio manager said he would be happy to help with this. I emailed the portfolio manager a few week later and he responded back with a very curt email explaining that what Pegasus does is top-secret and he would need to get approval from legal before talking with me.

In May 2002, we called Mark and asked for his help with interviewing Pegasus and buyers and suppliers participating in Pegasus. Mark was more than happy to help. He called Pegasus' suppliers that were also Lone Star Utilities' suppliers and introduced us so we could set up interviews. He also asked Pegasus' Buyer Development Manager, who was on-site at Lone Star Utilities, to help us with interviewing Pegasus' Chief Executive Officer and Gulf Coast Energy. The Buyer Development Manager set up our interviews. When we interviewed Pegasus' Chief Executive Officer, he told us that we were one of the first interviews he had given. He said during the "dot.com" boom analysts were frequently calling him for interviews.

We also interviewed Pegasus' Sales Vice President. During our interview, we asked which utilities had joined Pegasus and subsequently dropped. Pegasus' Sales Vice President told us Pegasus didn't even know who to talk to at these utilities. He did not tell us the names of the utilities. In January 2003, I asked Mark if he knew who the utilities that had quit using Pegasus were. He contacted Pegasus' Buyer Development Manager. The Buyer Development Manager wouldn't disclose who these companies were and wanted to meet with Mark about Mark asking for this information. In January 2003, Mark was at a conference and ran into a friend working at another utility. The friend told Mark they had dropped out of Pegasus. Mark told the friend about me and then told me about the friend. I contacted the friend and, after a few attempts between March and May, I interviewed him. I would have never gotten such lengthy interviews with such high-level people had it not been for Mark's help.

In February of 2002, my husband and I were at a Houston Astros Party in Temple, Texas. We were talking with Brett, a fellow my husband and I used to work with, about my dissertation. Brett told us that his company was involved in NTX and they had documented several hundred thousand dollars savings from using NTX. This was a little different than the marketplaces in which I had been working. CSX and Pegasus had been struggling.

After I defended my proposal, I remembered this conversation with Brett and asked my husband if he would call Brett so I could interview him for my dissertation. My husband called Brett and Brett called Jennifer, the lady at Leading Edge Brands that uses NTX. I interviewed Jennifer and Brett. Brett's boss, Webb, mentioned that Texas Plastics uses NTX heavily and that he could get me an interview with them. I said great and he called the President and introduced me. I then called the President to set up the interview. The day I went for the interview I called the President to reconfirm and the receptionist told me the President no longer worked there. After I told her what I needed and that I was a friend of Webb's, she arranged for me to speak with Randy, the Warehouse Manager that actually implemented NTX.

Neither Leading Edge Brands nor Texas Plastics had a relationship with NTX's executives. In addition, NTX did not disclose which carriers were using NTX. Randy, from Texas Plastics, told me he had seen R.E. Transport and Southwestern Trucking pick up for NTX. My husband mentioned that McMurray Foodservice (a foodservice distributor owned by McMurray Distributing) had contracts with lots of carriers. My husband set up an introduction with McMurray Foodservice's Vice President of Logistics. She told me she used R.E. Transport extensively and that they were currently negotiating a new long-term contract with R.E. Transport. I interviewed her as an NTX nonmember and then requested her contact at R.E. Transport and asked if I could use her name as I called R.E. Transport. She said I could. I called R.E. Transport as a student McMurray Distributing was helping. I got shuffled from the R.E. Transport sales representative, up to a Senior Vice President, and back down to a bid manager. I interviewed the bid manager regarding R.E. Transport's use of NTX.

I needed another carrier. My husband contacted the President of Merit (a long-haul trucking company owned by McMurray Distributing) to see if I could interview him. Merit was not using NTX and had chosen not to get involved with online marketplaces. I interviewed Merit as another NTX nonmember. I still needed another carrier. I was studying NTX's website one day and noticed that Southwestern Trucking was on their advisory board. I also noticed that the advisory board member was from Southwestern Trucking in Waco, Texas. I used to work with a lady that works for Southwestern Trucking. I called Deborah and scheduled lunch. Deborah and I ate lunch and I asked her if she knew Eddie, the Southwestern representative that sat on NTX's advisory board. She knew Eddie and later told Eddie about me and my study. I then called Eddie and went to Southwestern to interview him. Interviewing Eddie gave me a low seller's perspective on NTX.

Because Eddie sat on the advisory board, he knew who at NTX could answer questions regarding getting people to join and use NTX. He gave me NTX's Director of Sales' name and phone number. From the interview with Eddie, I knew Eddie did not have a strong enough relationship with NTX's Director of Sales to help me get an

interview. I also knew if I “cold called” the Director of Sales, I wouldn’t get to meet with him. After some thought, I decided if I could get one of NTX’s customers or a potential customer to call Brent I would have better luck getting an interview. My husband talked with Brett, the Chief Financial Officer of the company that owns Lone Star Plastic and Leading Edge Brands. Brett called NTX’s Director of Sales, introduced himself, explained several of his companies were users, and explained my project. NTX’s Director of Sales agreed to meet with me. I then called him and visited him in Dallas.

By the time I started the study, Retail Matrix had folded and I could find no information about Retail Matrix on the Internet. Retail Matrix had taken down their Internet site. The United States Convenience Store Association (USCSA) is the trade organization for the convenience store industry. USCSA formed Retail Matrix with the help of two technology companies. McMurray Distributing is a long-term active USCSA member. My husband knows the McMurray Distributing Vice President that is responsible for McMurray Distributing’s active role in USCSA. My husband asked the Vice President if I could interview him to get McMurray Distributing’s perspective as a nonmember in Retail Matrix. I got the interview. In the course of the interview, it became obvious that Roger knew a lot about USCSA and knew the Senior Vice President at USCSA who was in charge of getting the industry to join Retail Matrix. I asked Roger if he could introduce me to this Senior Vice President so I could meet with her for my dissertation. He called her, she agreed to meet with me, and a few months later we met in Alexandria, Virginia.

She was very helpful. Because the website was down, I did not know what companies had joined Retail Matrix. In the course of the interview, she explained that Retail Matrix had several companies sign letters of intent, but by the time Retail Matrix became incorporated the “dot.com” bust hit and the companies backed out. I mentioned that I needed to interview some buyers and suppliers for my study and she gave me the contact information for a buyer and supplier that were close to joining. I asked if she would introduce me to them and she agreed. A little time passed after my interview with



her and I had not heard back on whether I could contact the two people that were close to joining Retail Matrix. She mentioned in a follow-up email that she had left them both voice mail messages. I called the fellow with SuperSport Retail, introduced myself as a student USCSA was helping, and scheduled an interview. He was very helpful.

I try not to leave voice mail messages or send email messages when introducing my study and myself. If I call the person until I catch them at their telephone, I will have more success scheduling a visit. However, I tried several times a day for several weeks to contact the Retail Matrix supplier I needed to interview. I could never get this person at his telephone. I knew if I called and left a message he would probably not call me back. McMurray Distributing (the company my husband works for) is one of this supplier's largest customers. I thought if McMurray Distributing called this person then he would call them back. My husband called the supplier, left a message, and the supplier immediately called him back. My husband introduced himself, explained my study, and scheduled a conference call time. I interviewed the supplier the next day.

My husband knew that the competing industry distributor was also involved in Retail Matrix. He knows his counterpart at this company very well. He called her and introduced my study. She agreed to visit with me, as she was involved in her company's decision to join Retail Matrix.

I wrote this confessional account of how I got in so other people trying to do this kind of work would know how to do it and how difficult it is. I have never been turned down for an interview. This is because I had two people (Mark and my husband Kevin) with extensive business contacts introducing me to companies. While I've never been turned down, this process of getting in takes time. I usually have to wait for my contact to contact the other contact, and then for the other contact to contact the person I actually need to interview. Once I got an interview I tried to get the person I was interviewing to introduce me to the other people in the marketplace that I needed to interview. Sometimes this worked and sometimes it did not. When we met with Pegasus in the summer of 2002, we asked for the names of the companies that did not join Pegasus and also asked for an introduction to Pegasus' highest user. The Pegasus

Vice President didn't want to give us the name of the utilities that signed up for Pegasus and did not use. We never heard back from him on an introduction to the marketplace's highest user.

Whereas I've never been turned down for an interview, this process is very time-consuming and requires maintaining an open schedule because you never know when you'll be invited for a field visit. We tried for over two years before I got the interview with Retailer Market Exchange's President. When Pegasus' Buyer Development Manager called me to say he had scheduled an interview with Pegasus' Chief Executive Office, the interview was in two days. Because I was trying to interview very high-level people and my interviews were dependent on someone that was helping me setting them up, I had to drop everything and go whenever the interview was scheduled. If I were to say, "that does not work for me, let's try another day" chances are the person helping me would have grown tired of helping me and I would have never gotten the interview.

Preparing for these interviews was time-consuming. I had to find out where I was going. Because most of my interviews were in large cities, I would always leave early just so I wouldn't be late. This almost always resulted in me arriving at the location more than an hour early. Because I was interviewing very high-level people, I would practice the interview for hours before I actually met with them. The interview always turned out really good and they were always very helpful and interested in the study. I would always write a note thanking them for their time. I have also promised to write a white paper sharing the results of my study with each of them. This is a way of thanking them for participating, but will also strengthen the study's findings. Given how difficult it was to secure interviews with each of my informants, it will be even more difficult to go back to each of them and ask their input on the validity of my results. The white paper will be a forum for doing this. I plan to send the white paper and then call them and see what they think about the study's results.

**APPENDIX C****ACRONYMS**

<b>Acronym</b>	<b>Definition</b>
B2B	Business-to-business
CEO	Chief executive officer
COSS	Customer-oriented strategic system
EC	Electronic commerce
EDI	Electronic data interchange
ERP	Enterprise resource planning
HB	High buyer
HS	High seller
IOIS	Interorganizational information system(s)
LB	Low buyer
LS	Low seller
NTX	National Trucking Exchange
RFQ	Request for quote
CSX	C-Store Exchange
SKU	Stock keeping unit
USCSA	United States Convenience Store Association
Y2K	Year 2000

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McLane Company, Inc. (A Wal-Mart Subsidiary)

November 1994-August 1996	Senior Staff Auditor
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